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MAR 1911

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Gleanings in Bee Culture

VOL. XXXIX

MARCH 15, 1911

NO. 6

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THE A. I. ROOT COMPANY

8-10 Vine Street, Philadelphia

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Phone, Market 2433-A

Gleanings in Bee Culture

Published by The A. I. Root Co., Medina, Ohio.

H. H. Root, Assistant Editor

E. R. Root, Editor

A. L. BOYDEN, Advertising Manager

A. I. Root, Editor Home Department

J. T. CALVERT, Business Manager

Entered at the Postoffice, Medina, Ohio, as Second-class Matter

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Editorial

THE HONEY-COOKING RECIPES.

IN response to our two requests for cooking recipes, using honey, a large number were sent us. After having thrown out duplicates, also all which were practically the same as those given in back numbers of GLEANINGS or in the A B C and X Y Z of Bee Culture, we still have a list of nearly 100 which appear to us most excellent. The list includes cake, cookies, bread, biscuits, gems, doughnuts, jelly and preserves, candy, popcorn balls, salad dressing, pancakes, cereal coffee, puddings, vegetables, pie, baked apples, custard, junket, layer-cake filling, mince meat, etc. We have been very glad to issue the proper credits that we promised. So far as possible, in the case of duplicates, credits were issued for those received first; but there were many that were practically the same as the ones in the A B C and X Y Z of Bee Culture, and for these, of course, we could allow nothing.

We believe that a book or booklet giving a large number of practical ways of using honey in cooking will help considerably in educating the public as to its value as a food; and honey is not expensive when the quality of the product is compared with that made with cheap molasses and glucose.

THE QUESTION OF A WINTER NEST AND ITS RELATION TO LOCALITY.

IN the general discussion that has appeared between Mr. J. L. Byer and ourselves it might appear that there was a vital difference in us as to our practice and belief; but a more careful reading of the articles and the footnotes on pages 19 to 21, Jan. 1, and 65 to 67, Feb. 1, as well as pages 134 and 135, March 1, show that we are nearly if not entirely of the same mind when we take into account the difference in the localities south of the lakes and that portion north of the lakes where Mr. Byer lives.

Our correspondent has sent in another article, and this ought properly to appear in this (March 15th) issue before the reader loses all connection or is ready to turn his attention to matters relating to *spring* rather than *winter* management. But, by the time this article was sent to us in Florida (where we are temporarily residing) it was too late for it to get back in time for that

issue, and hence the only alternative is to use a portion of it in the editorial department, which is printed on the last form. The articles in our March 1st issue, together with the general footnote, which our correspondent had not seen, very largely anticipate some things that he has to say, so we will omit that portion. Apparently laboring under the impression that we are still wide apart he says:

In the footnote to my article the editor refers to my admission that, in the cold spell, I found the bees for the most part below the honey, and says that on this point there is no difference between us. Please remember that this was in January when the examination was made, and that over the bees there was "at least four or five inches of sealed honey" at that time—indeed, in many of the colonies there would be six inches. How much honey would there be in the top of combs at that date, if in the fall there had been but two or three inches of honey? Here in Ontario by the first of February, or along that date, there would be *none*, and, just as sure as fate, in this present winter, colonies that were in that condition in the fall will be dead, either of starvation or dysentery, before spring. Now, while I was not advocating *solid* combs of honey in the center of the brood-nest, I wish to remove a wrong impression given in regard to Mr. McEvoy's practice of wintering outdoors on that system. It will be noted that I specified that I would want the combs in the center of the brood-nest filled at least *half way* down. One of friend McEvoy's strongest arguments in defense of his system is that it prevents the colony starting a lot of brood early in January, when we generally have a week or so of comparatively warm weather—not often mild enough to allow a flight, yet enough so to start a lot of brood in colonies having a lot of empty comb in the center of the brood-nest.

Notice he says he is not recommending "solid combs of honey;" that he has advocated that he would "want the combs in the center of the brood-nest filled at least half way down." For a locality much colder than ours we say amen to every word of this. We based our original statements on pages 19 to 21 on conditions as they exist in the average locality where bees are wintered outdoors. In a locality as cold as that in which Mr. Byer lives, the great majority of bee-keepers winter *indoors*. Mr. Byer's locality represents unusual conditions, or, rather, we should say, conditions in respect to cold not found in localities where bees are wintered outdoors. As editor of a bee-paper we try to fit the *average* locality in any directions that we may give. When a locality has a condition that is out of the ordinary for the practice recommended, due allowance must be made. We therefore cheerfully accept Mr. Byer's recommendation or correction, if you please, for a locality as far north or as cold as he has. That bees need more honey above the cluster for colder regions is but natural.

As to the reason for shutting out brood-rearing, Mr. McEvoy has already explained himself in our March 1st issue, page 135.

E. R. ROOT IN FLORIDA.

For two or three years back I have cherished the thought that I would visit the one State in the Union into which I had never set foot. One thing and another have delayed that visit until this winter. Our youngest, a little six-year-old (A. I. Root second), came down with whooping-cough. As he was having it very hard, the doctor said that we had better take him to Florida at once. How to get him there without exposing other children was a problem. We decided to secure a drawing-room, or state-room, on a Pullman where wife, boy, and I could travel by ourselves to Baltimore. Thence we took a state-room on a boat to Jacksonville, and from Jacksonville we took another Pullman drawing-room direct to Bradentown. We arrived on Saturday, the 25th of February, in the land of sunshine and flowers. What a contrast! It was cold and rainy at Medina when we left, and at Bradentown it is hot and dry. It was excessively wet at Medina, and excessively dry here. But, notwithstanding, I find just the country I have pictured in my mind's eye—a beautiful climate, tropical vegetation, and a bracing air. While the A. I. R. second still "whoops" he is much stronger, although we have been here but four days. Now, you will wish to know what I think of A. I. R.'s Florida home. Say, it would do you good to see him play with his chickens, his posies, and his plants. He has his place nicely fixed up; and as he takes you over his grounds you can't help sharing his enthusiasm. How he delights in showing the visitor his latest acquisition, this new plant, his ducks, his Buttercups, his coops, his waterfall, his creek back of the lot! and Mrs. A. I. R. too—what a world of good it is doing her! Say, you needn't tell my wife; but mother's cooking does taste so good!

Many people have been ordered by their physician to go to Florida, little dreaming that their poor health is really a blessing in disguise. I have met many persons who, before they came here, were verging on the brink of the grave; but after a few weeks or months of this climate they have found the "fountain of eternal youth."

But what about Bradentown in particular? I don't know much about other spots in Florida; but I see tropical vegetation in all its glory. The freeze that visited many parts of Florida within the past week has done no damage here; indeed, Bradentown, by reason of its peculiar location on the bay, is protected in a way that most towns in this part of the State are not. Orange-groves are being set out everywhere around here, and old trees show that the climate here has been kind to them. The people are of the best from all parts of the United States; indeed, I don't know of any com-

munity where one will find better company than here. Many bee-keepers who have read GLEANINGS have located here, not necessarily to keep bees, but to raise fruit, keep poultry, or raise garden truck. If it keeps like this we shall have a GLEANINGS family here.

There! some of you will think I am trying to boom Bradentown. Neither my father nor myself have any land to sell. We are not interested in any scheme. A. I. R. came here to get health and rest, and has found both.

E. R. Root.

NEW EDITION OF ADVANCED BEE CULTURE.

ABOUT twenty-five years ago W. Z. Hutchinson, editor of *The Bee-keepers' Review*, was producing comb honey by hiving swarms on frames without foundation. In many respects this was similar to the Simmins non swarming plan; but Mr. Hutchinson, apparently, did not have so much in mind the idea of preventing swarming as the production of fancy comb honey, and at the same time save the cost of foundation. His experiments at the time were written up fully in GLEANINGS. These articles aroused so much interest that A. I. Root prevailed upon him to write a booklet describing his system. This appeared in due time, and was entitled "The Production of Comb Honey."

In the meantime, Mr. Hutchinson started *The Bee-keepers' Review*. After this had been running a few years, during which time he took up special topics, the edition of his little book was exhausted, and he was prevailed upon again to write a much larger work, taking in not only his system for the production of comb honey but all these other special-topic subjects as well. The new work, entitled "Advanced Bee Culture," appearing in 1905, was printed and illustrated on the finest enameled book paper. The illustrations were all original, for the author had taken up photography. Some of his photographs are veritable works of art.

While the work was designed for only a very limited class of bee-keepers, the edition was exhausted some months ago. Having a good many calls for it I wrote to Mr. Hutchinson, inquiring why he could not get out a new edition. I received back word from his wife that Mr. Hutchinson was sick in the hospital, and had been there some months. After our friend had partially recovered, the thought occurred to me that possibly I myself might be able to revise the book by inserting in their proper places recent editorials that had appeared in *The Bee-keepers' Review*. As there seemed no immediate prospect of his early recovery, I wrote him suggesting that I undertake the work for him, saying that my somewhat extended experience in revising and revising and revising again the various editions of the A B C and X Y Z of Bee Culture might qualify me for a similar work on "Advanced Bee Culture."

After some correspondence this was agreed to. The task then devolved upon me of going over old volumes of *The Bee-keepers'*

Review since the last edition of "Advanced Bee Culture" had been published, selecting such of the editorial writings as would be suitable to incorporate in the new work, and crossing out old matter that might be in conflict with it. After a few evenings' work (for I had no other time to devote to it) I finally got the matter all together and turned it over into the hands of the linotypers—not until, however, I had submitted to Mr. Hutchinson all the changes that I proposed making and the manner of incorporating the same into the work. I received a postal from the sick man, reading something like this: "I marvel at the skill of your selection, and also your manner of joining new matter on to old; in fact, you have made just about such changes as I would have made had I the strength and the health to do it."

During the years since the first edition of "Advanced Bee Culture" was published, Mr. Hutchinson has had a large experience in the field, especially in out-apiary work. He and his brother Elmer have tested many new devices, as well as having discovered some new kinks in the trade. The result of all these experiences was written up from time to time in the pages of *The Bee-keepers' Review*, and the task that devolved upon me was to select this matter from the pages of *The Bee-keepers' Review*, and signed articles of his that appeared in the columns of GLEANINGS. All these were woven into the main body of the work.

Some minor changes are made all through the work; but we will speak of only the principal changes. For example, in the chapter entitled "Producing Good Extracted Honey" I have incorporated editorials from *The Bee-keepers' Review*, and a portion of a series of articles by Mr. Hutchinson on the subject of "Producing Extracted Honey," that appeared some time ago in these pages. This new matter has been added to the old in such a way that the whole reads like one continuous story. The new matter deals with the question of extracting the honey, of tiering up and extracting after the harvest is over, securing workers for the harvest, warming up the honey, uncapping-barrels and tanks, with quite an extended description of E. D. Townsend's uncapping-box. The steam-heated uncapping-knives and power-driven extractors received their fair share of attention, for, in fact, the Hutchinson brothers tested them quite thoroughly during the last three or four years in their northern apiaries. In fact, this whole chapter fairly bristles with the experience of actual *field* work.

Then we find, a little further on, an entirely new chapter on the subject of "Developing a Mail-order Trade for Honey." This is nothing more nor less than a reproduction of an article or articles that appeared in GLEANINGS over a year ago. It takes up the all-important question of how to sell extracted honey, how to advertise, how to secure two or three cents above the market for honey in original packages.

On page 145, under the head of "Foul

Brood" appears a discussion of the subject of European foul brood and its treatment, especially how to cure without destroying either the brood or the combs. On pages 154 and 155 is quite a little new matter under "Apiarian Exhibits at Fairs."

The chapter on "The Rendering of Beeswax" is quite extensively revised. A recent editorial by Mr. Hutchinson describes the W. J. Manley method of rendering wax. As this method is clear up to date in every particular, nearly all the old matter was stricken out, and the new substituted.

Some new matter was added to the chapter of "Outdoor Wintering of Bees," and on page 164 we find another new chapter entitled "Automatic Transferring."

In the chapter on "The Influence of Temperature in Wintering Bees" we find some quite extensive revisions, taking up the special question of how to build bee-cellars at moderate cost. Here again we find the author drawing quite extensively from his experience in building bee-cellars in Northern Michigan. This one chapter, to the one contemplating a bee-cellar, is worth the price of the book many times over.

The chapters "Fertilization of Queens in Confinement," "Commercial Queen-rearing," and "Ventilation of Bee-cellars" are omitted from the new edition, either because they were out of date or because they conflicted with some of the author's recent utterances in *The Bee-keepers' Review*.

Taking it all in all, the new edition is entirely the work of Mr. W. Z. Hutchinson. While I have acted in the capacity of reviser I have added no word of my own except here and there to put in a connecting link in order that the old matter might join on smoothly to new. Taking it all in all, there have been added between thirty and forty pages of entirely new matter, and something like an equal number have been stricken out, so that the new edition will be about the same size as the old one; but instead of being sold at a price of \$1.20 it will be sold for an even dollar, postpaid.

As a writer on bees Mr. Hutchinson has few equals. For clearness of style and accuracy of judgment he is second to none. His enthusiasm shines forth on every page. His selection of the new and the useful from an extended discussion is intuitive. The last edition of "Advanced Bee Culture," as well as the new edition before, is made up of the best ideas of our best experts, properly classified and condensed by a master of the art of boiling down discussions.

I do not hesitate to say that this is one of the most valuable books on bees that was ever put out; and while its title would indicate that it is designed only for the advanced bee-keeper, yet I am sure that a large number of beginners in the business will find it exceedingly helpful and interesting, especially if they will take it in connection with some other work like the A B C and X Y Z of Bee Culture, or any text-book designed especially for the beginner class.

E. R. Root.

Stray Straws

By DR. C. C. MILLER, Marengo, Ill.

MR. EDITOR, your idea of the bees' get-together-in-a-ball idea, p. 136, is O. K.

INSTEAD of nailing up bees in the hive, as suggested, p. 123, it might cause less worry to take them in the cellar.

"MAY GOD hasten the day when good women shall do at least some of the voting," p. 117. Make it "vote same as men," Bro. Root, and I'm with you.

DO BEES gnaw down entire old combs and rebuild, p. 88? Possibly; but if so it seems as if I ought to have seen some indication of it after keeping so many old combs all these years.

FRIEND CAVANAGH, you suppose, p. 109, my foul brood was "treated the same season as discovered?" If you promise not to tell, I'll own up to you that I discovered it in one hive two or three years before treatment, but thought it was poison.

THAT WEIGHING-DEVICE, p. 114. Suppose one side of a hive heavier than the other. Place it on the weigher with the heavy side toward the scales, and let it weigh 50 pounds. Now turn the hive with the light side toward the scales, and it will weigh more than 50 pounds. In general, the closer to the scales an object is placed, the lighter it will weigh.

QUITE RIGHT you are, Mr. Editor, in telling C. A. Neal, p. 149, that his queen will spread out rather than go above; but taking the question just as he puts it: "Will a queen in a twelve-frame Jumbo lay in the four outside frames, or will she go up in the super?" my answer would be that she will do neither. Generally the central eight Jumbo frames will be enough for her.

"WHAT's in a name?" says the editor of the *Irish Bee Journal*; but he seriously objects to the long names that are now given to foul brood and black brood. My sympathies are with you, Bro. Digges. But I am told there is a kind of necessity in the case. Our State laws are against foul brood, and black brood would not come under that head; but American foul brood and European foul brood do. Well, there's no law against contractions; and we can say A. f. b. and E. f. b.

ALIN CAILLAS, *L'Apiculteur*, p. 464, estimates that a bee carrying .0007 oz. of honey at a load will make 12,632 trips to fill a section 4 inches square and 1 inch thick. If it average $\frac{1}{2}$ of a mile to the trip, it will travel as much as a third of the way around the world. In a colony of 120,000 bees, if 80,000 are fielders, and each one makes 10 trips of $\frac{1}{2}$ of a mile daily, the total travel for the day will be more than twice the distance to the moon. As flyers, the Wright brothers are not in it with the bees. [If a bee car-

ried .0007 oz. of nectar it would have to make nearly twice 12,000 trips in order to make enough honey to fill a section 4 inches square and 1 inch thick.—ED.]

IT'S A TOUGH JOB for me to make out the meaning of things in French journals, but it's a comfort to know that Frenchmen sometimes get things twisted that are said in English. In a *Straw*, Dec. 15, I spoke of the size of worker-cells, and then, changing the subject, said: "If your foundation hangs within $\frac{1}{8}$ inch of the bottom-bar, I guarantee your bees, if they are like mine, will increase that $\frac{1}{8}$ to $\frac{3}{8}$." In *L'Apiculteur*, p. 75, it appears in this fashion: "Dr. Miller says to Mr. Root, that, if the foundation be enlarged by $\frac{1}{8}$ of an inch, he guarantees that his bees, like his own, will increase from $\frac{1}{8}$ to $\frac{3}{8}$!"

"IF THE MAJORITY in any community want saloons, they can have them, as things are at present," page 120. That's true; but let's not have things continue as at present. A community ought to be allowed to vote out a thing that's wrong; but no community has a right to vote in a thing that's in and of itself wrong. In that respect the saloon stands solitary and alone as the only thing inherently wrong that people are allowed to vote in. Ever think of it? If a community were to vote in polygamy—and some communities might want to—it wouldn't be allowed for a minute. Why should it be allowed to "vote in" saloons any more than polygamy or stealing?

F. B. CAVANAGH, you're harping on the right string, page 146. What we want is a campaign of advertising—not local, but national. No thirty-cent business, but thousands of dollars. With the right kind of advertising, honey should become a staple instead of a luxury, and should take its old place alongside of butter in price. If one-fourth as much honey were consumed as butter at 10 cents a pound it would total more than \$180,000,000. If we could reach that amount by advertising, don't you believe it would be a good stroke of business to spend one per cent of it in advertising? Even if we spent only one-tenth of one per cent it would give us the neat little sum of \$180,000. But without speculating on future increase, what bee-keeper can not afford to spend for the right kind of advertising \$1.00 for every \$100 his crop brings? Let's see what that would amount to with present conditions. I think Dr. Phillips estimates the present output at \$20,000,000. At \$1.00 for every \$100 that would give us \$200,000. We are well able to do that if Cavanagh, Tyrrel, Rauchfuss, and others will only get us together. I'd be glad to chip in on that scale if it brought us only enough more to pay for the advertising. It would be worth it to know that all over the land every one was eating honey. Health of nation. But it wouldn't turn out that way. I feel sure that every dollar invested in that kind of advertising would bring back at least ten. Let's do it.

Bee-keeping in the Southwest

By LOUIS SCHOLL, New Braunfels, Texas

ABOUT THOSE HONEY RECIPES.

We have noticed with much interest the matter of honey-cooking recipes, and the interest that is being taken in them at the present time. We have wanted to mention this matter for some time, but we have not completed our work on the matter entirely as yet. For several years we have been at work on a list of *real good honey-cooking recipes*, such as can be used as per the directions given, without getting a lot of unfavorable results, as has been our experience when we tried many of the recipes that have been published. The trouble with them has been that they are very much out of proportion as regards the ingredients used; and the result is, that the much-expected honey cake or cookie does not come up to any thing like the great expectation that most persons have about a honey cooked article. This is wrong; and, instead of creating a greater demand for honey for cooking purposes, the very opposite is likely to take place.

This fact came to our notice very strongly since our exhibitions of more than thirty different varieties of cakes and cookies at the various fairs for several years. Our exhibits have attracted much attention, and the demand for recipes grew, but we were not able to furnish them, as we did not have them printed. One year we distributed several thousand honey-cooking leaflets at the fairs. That was before we exhibited very many honey cakes. Later we found that the recipes were not reliable, and that it was necessary in almost every case to change the quantities given, or something else. When we returned to the fairs the next year we learned from a large number that they had not been able to get the results that we had from the recipes received from us, and we have not made use of any more of the leaflets, just for that reason.

Now we are making an entirely new list of all the various cakes and cookies tested. Of course, it will be understood that we are not condemning all the recipes; but there are so many of them that we have failed with that the entire list ought to be revised, even if some of them give good results. And, again, it must be remembered that "many cooks spoil the pie," and this may be one reason to which some of the failures may be attributed. In the meantime let us have all the good recipes in which honey is used more or less; and if any of them need trying before they are in such shape that every good housewife can use them without getting bad results, why—well, somebody will have to try them out. [We agree with you; and for this reason we decided from the very start to accept no one's word for any thing. The trouble is, that the orig-

inator of a recipe often fails to mention some little important detail, and the result is failure. But this is also true with recipes of any kind.—ED.]

BREEDING LARGER BEES.

The more we study this question the more we wonder if it may not be possible. We need only consider for a moment the great work done in improving all kinds of animals, improving not only certain qualities, but increasing the size materially. It takes many generations before some of the final results are obtained; but we have the proof that all this is possible by proper selection and breeding and the proper care and feeding has something to do with it also. The question is, how to proceed with the improvement of the honey-bee to accomplish similar results. And then the question arises as to what would be the advantages of the larger bees. This is work for the experiment stations.

Whether an increase in the size of the cell in which the bee is reared would have any bearing on the matter could, perhaps, be observed by careful experimentation carried on for a number of years and through many generations of the bees selected for the test. Not only this, but several strains of bees should be tried—each under various conditions, since all these factors may have some important influence.

We have noticed in our observations that a great difference in the size of the workers of different colonies does exist. The progeny of a fine queen may show extraordinary size, while that of another queen may be remarkably small. After investigating more closely we have come to the conclusion that there are at least two reasons for the smaller size of the workers in various colonies: First, the naturally small size due to the queen alone; second, the decreased size of the worker-cells of old combs in which many generations of bees have developed. Such observations can be made in a neglected or "run-down" lot of bees where the old combs have been left undisturbed for years, the brood-nest being confined to the same area. In this case the size of the cells should make a difference. On the other hand, the deterioration in the quality of the queens in such a neglected condition is the main cause of the smaller-sized workers.

We have, therefore, two factors which account for a *decrease* in the size of the workers, so why may not other factors have some influence toward an *increase* in the size of the worker bees?

We grant that the use of larger worker cells in a haphazard way will not bring any certain results. Neither can we expect that the size of the worker bees can be increased by the most careful breeding by selection or otherwise without resorting to something larger than the regular-sized worker-cells in which to rear them. But we have some faith in breeding for larger size by careful selection in connection with a gradual increase in the size of the worker-cells.

Siftings

By J. E. CRANE, Middlebury, Vt.

The best and most concise statements on indoor wintering we have ever found are on page 779, Dec. 15.

The advice of Wesley Foster, page 6, on "jumping the price to large buyers," is first rate and worthy the attention of those who do so.

On page 4 Dr. Miller again expresses his conviction of the value of breeding for a non-swarming strain of bees. Footnote says, "Good for you! We grant *something* can be accomplished." I say, good for you, Mr. Editor.

I don't agree with you, Mr. Editor, when you say, p. 772, Dec. 1, that propolis could not be furnished for less than \$5.00 per lb. with which to make varnish. I should have been glad to receive ten cents a pound for some forty or fifty pounds the past season when we were through cleaning sections.

It is interesting to know approximately that it takes 37,333 bee loads of honey to make a pound of honey. This means more than a million flowers visited. It might be well to remember this as we complacently spread our bread or buckwheat cakes with honey these cold mornings, and boast of our success as bee-keepers.

I was much interested in M. A. Gill's statement, p. 771, Dec. 1, that the average yield of sugar from beet as grown in Colorado is about 16 per cent. It is just one hundred years since Germany commenced the manufacture of sugar from beets, when the sugar content was less than 7 per cent. See what can be done by careful breeding and selection.

I was much interested in the editorial, p. 745, Dec. 1, 1910, on the value of corrugated paper on the bottom of wooden cases, as compared with no-drip cleats. I felt sure of its value when I recommended its use four years ago, and it is quite right to advise those who have cases with drip cleats in them to rip them out and substitute corrugated paper.

On p. 46 Mr. Gately tells us of the value of foundation in securing surplus section honey, estimating the gain at from five to twenty-five per cent. If we call it fifteen per cent (and my own experience would place this estimate as conservative) on a crop of fifty pounds per hive, it would make $7\frac{1}{2}$ pounds, which, at 14 cts., would be \$1.05; and if we take out 25 cents for the value of

the full sheets of foundation we still have 80 cts. per hive as above, where starters are used, to say nothing of the improved appearance of the sections.

On page 777, Dec. 15, the editor gives some vigorous blows against "our antiquated methods of shipping comb honey." Good! lay it on till all know the value of cushioning every case. I have sometimes thought I was saying quite too much in praise of corrugated cases where every comb was cushioned by two or three thicknesses of this paper; but the more we use them the better pleased we are.

Mr. Doolittle's advice on books for beginners, p. 36, is good, and I believe he is quite right when he places the A B C and X Y Z at the head of the list. And then he tells us how he used and "swore" for thirty-five years by the Gallup frame. I am glad he doesn't swear by that frame any more, but uses a good standard Langstroth instead; but for all this we shall always hold that little square frame in grateful remembrance as we recall the wonderful lessons in the principles of bee keeping that father Gallup gave us, using that same frame to illustrate his ideas.

I believe the editor is quite right in thinking that the explosion of beeswax was caused by steam; and quite right is the advice to introduce water before the wax is melted. Better still, to my mind, would be to melt in a double boiler. If wax or combs are melted in water, great care should be taken not to let it get too hot, for, as sure as you do, it will boil over, when it will at once burst into flame as soon as it strikes the hot stove. I have twice come near serious loss from this cause. When making wax, it is never safe, when melting up over a stove, to leave the room when the water and wax are near the boiling-point.

"Candied comb honey—what shall we do with it?" p. 29. I'll tell you what I do with it. Get it all together with any cappings with honey in them, and put in a double boiler or capping-melter, and heat just hot enough to separate the wax from the honey; and then if the honey is not good enough to sell for table use, keep till I need it to feed, which is not, usually, a great while. Every pound of such honey fed in spring where needed will doubtless result in two pounds of new honey more than the colony would have produced if it had not been fed. Capping-melters are useful for this purpose.

Evidently D. M. Macdonald doesn't believe in sealed covers, for he says, p. 9, that "The nearer you go to hermetically sealing up the body under a press of heavy coverings, the nearer you go to defeating the very end you are striving to attain. The body becomes bathed in perspiration, and

discomfort follows. Bees breathe all over their bodies; and if their primary and secondary organs can not get full play they are not wintering under favorable circumstances." Well, he is well north of the fifty-fifth parallel, and sees the value of sifting out the moisture and retaining just the heat.

On page 748, Dec. 1, nearly a column is taken up in discussing the non-swarmling race of bees. May I inquire what is meant by a non-swarmling race of bees? Are we sure we understand each other when this term is used? Do we mean a race, breed, or strain of bees that will, under normal conditions, but rarely swarm—say not more than from one to four or five per cent annually? or do we mean a strain that will *never* swarm under any conditions whatever? If the latter is meant, and the same test is applied to non-sitting breeds of fowls, can we say we have any non-sitting breeds of fowls?

On page 32 Dr. Miller wonders why Mr. Latham's honey should not granulate like other folks' honey. I think I can see a twinkle in his eye as he reads the editor's comments, and saying to himself, "Simple enough if you only know how." Mr. Latham teaches science in the schools of Norwich, and practices it when he is at work with his bees, and performs some stunts with his bees and honey that would surprise some bee-keepers older than himself. For instance, he wintered some thirty or forty nucleus colonies last winter in an out-building, without the loss of a single colony, and an average consumption of only $1\frac{1}{4}$ lbs. of honey per colony.

I do not think Doolittle is wise in advising what is practically a hexagonal plan of apiary, see page 783, Dec. 15, unless there are a good many shrubs and trees. I have tried two such, and gave them both up after a trial as impractical. The loss of young queens and even full colonies was too great. No way suits me so well as to have the hives in groups of ten, two facing north, three east, two south, and three west. Where there is much wind, say from the north or west, face those on that side the same as on the opposite side, when the bees will fly through the center of the group. Wind is very bad for bees, especially when wintered out of doors.

I suppose nearly or quite three-fourths of the honey from Vermont has gone to market this year in paper cases, and there would have been a still larger proportion had not bee-keepers had on hand a supply of wooden cases. While we believe these cases are better or safer so far as breakage is concerned, yet we find that even they are not "fool-proof;" and where honey is shipped long distances in small lots, and likely to be changed from one car to another, it is desirable to crate them with a layer of straw

or excelsior on the bottom. "Now, then, will the bee-keepers of this day and age wake up and put their honey in more up-to-date cases?" as you say, page 778.

Wesley Foster, p. 750, Dec. 1, says labels on cases of comb honey should be six by eight inches, and the words "Fragile! Handle with care, this side up," printed in red ink. Now, this is all right; but I like a red or yellow paper with print in black quite as well. He says, further, that honey in 60-lb. cans should have the cases bound with strap iron if the honey is liquid, and he is right. I wish some of those Western beekeepers could see some of their cases of honey when they reach us here in the East. It would do their souls good, or ought to. Keep on hammering, my brother.

On page 782, Mr. Scholl still talks "bulk comb honey." I wish he would tell us how we are to market, say, 25,000 lbs. of comb honey and 10,000 lbs. of extracted, with markets from thirty to two hundred miles away. The bulk of honey is consumed this way in cool weather. If we cut our combs into chunks and fill with extracted honey, say in September, it will be all solid in a month's time. If we wait till later, the extracted will get solid before pouring it over the combs. If melted and poured on them it is likely to get solid again before it reaches the consumer. Besides, honey-consumers hereabout are somewhat like the boarder who found hairs in his butter, and told his landlady that he did not object to hairs, but preferred to have his hairs and butter served on a separate dish. So our honey-consumers seem to prefer to have their comb and extracted honey served in a separate dish.

At a recent meeting of the Vermont beekeepers, Mr. Terry, president of the Vermont Horticultural Society, gave us a fine address on the value of bees in the apple orchards of Vermont. Among other things he said that in Grand Isle Co., where are located some of the best orchards of the State, the orchards all blossomed profusely last spring, while only a part of them produced large crops of fruit. He said further, that he and another party examined every orchard with great care to discover, if possible, the cause of failure in some to produce as heavily as the others. The results of examinations showed in every instance that, where there were failures to produce abundantly, there were no bees, or too few to be of much use, and, further, that where a good supply of bees was kept, there was in every instance a large apple crop. A few orchards produced heavily where there were no bees kept in the immediate vicinity. This puzzled them as to the cause until it was discovered that every orchard producing heavily where no bees were kept was in the immediate vicinity of heavy forests where wild bees could do the work.

Bee-keeping in Southern California

BY MRS. H. G. ACKLIN, GLENDORA, CAL.

Mr. G. M. Gress, formerly of Minnesota, but now of Sioux Falls, S. Dak., who is spending the winter in Pasadena, reports a very good yield of comb honey from yellow sweet clover last season. The seed of this clover was sown by a bee-man of Sioux Falls. Would it not be a wise move for our bee-keepers to do likewise—especially near the coast, where moisture is almost sure during the entire year?

I note that Redlands has been selected by the manager of a moving-picture company as an ideal place to get the "real spirit of the west" views. Thirty people are to pose, etc., in canyons, preferably Santa Ana and San Timoteo. I was wondering if there would not be more of the "real spirit of moving" than is generally shown in pictures if that troupe were to get banked up against some of the big apiaries located in those canyons.

Coöperation! What does it really mean? and why is it more difficult to secure it in the honey business than in all other industries? I live in an orange section—orange-groves north, south, east, and west. Now, if some of the "little" growers, like myself, for instance, should get in a hurry for money, and sell their crops to outside parties for less than the association can get, I wonder what would happen. That seems to be the greatest stumbling-block to organization among bee-keepers. Orange-growers work on the mutual plan. In fact, the growers own the association. At the annual meeting they elect the men they want to carry on the business for them the coming year. Expense is shared, and profits divided. The grading rules are established on a firm basis. The people at the packing-houses attend to that. Any stockholder can make investigation if affairs are not run to suit him. I think everybody around here belongs to an association. Of course, right here the honey business is not as extensive as the orange industry; but there are apiaries located all along the foot-hills. But there was a time, also, when the orange industry was not as extensive as at present; but the growers were organized just the same. Why can not the honey-producers do the same thing?

In listening to discussions on this subject at conventions one is thoroughly convinced that coöperation is what bee-keepers now most earnestly desire. In union there is strength. A demand coming from an association has more weight than when coming from a committee. If banded together like some of the other industries, bee-keepers could demand certain laws, and eventually get something near what they wanted.

There are many ways in which the bee industry could be benefited. We need a State foul-brood law; and the office of inspector of apiaries should be given to a man fitted for the place instead of a man chosen on account of his political affiliations. And his deputies should be chosen along the same broad lines. We also need an iron-clad State law against adulteration of honey. And when those laws are enacted, men should be elected to office who will see that they are enforced. All this could be accomplished if bee-keepers were a unit.

How can bee-keepers become a unit? I see no way except through organization and coöperation. Drop all minor matters and work with an earnest determination for the one great object—complete organization. It matters not if one man gets his foundation at one place and another one section boxes somewhere else; it is not necessary for the organization to be a supply depot. The one great object should be to control the sale of honey. If some bee-keeper must have money at once, let the organization buy his honey. I know I am getting into troubled waters in making the above statement; but will some one please propose a better plan? Right there seems to be the greatest obstruction to organization. But how did these other mutual associations get started that are now on so firm a basis? It is more difficult to grade honey than oranges, and more opportunity for unfairness exists; but we must not be overcome by these obstacles. Disinterested parties should have charge of these matters. Bee-keepers will never come into their own till these problems are fairly and squarely met and conquered. And, as in all other great reforms, agitation is the only way in which to get parties most interested to considering and planning the best method of procedure.

Another Colony that Deserted a Hive Full of Honey in the Fall.

A Mrs. Byron, of this place, told me of a swarm deserting a hive, the same as Wm. Shields reports, p. 51, Jan. 15. The honey-flow stopped about Sept. 15, and on the last of October the bees were there. By the middle of November the bees were all gone. She had left the upper hive on, as she had lost bees the winter before for lack of food. There was over 80 lbs. of sealed honey in the hive; no dead bees in it. It was a large swarm. They took possession of the hive in June, and had done well. I saw them in September, and they were above the average. I thought she must be mistaken about their leaving, but she is positive.

Ignacio, Cal., Jan. 24.

A. I. MILLS.

Bee-keeping in Louisiana

Why is it that we hear so little from Louisiana? It is a natural bee country, and bees are now, Jan. 15, working as though it were summer, bringing in any amount of pollen and some honey. White clover is coming out fine. It generally blossoms in February. I expect to run three small yards this season, and shall have about 100 colonies at the home yard.

We can produce the honey here, but we have no near market. I am expecting to ship to Chicago, but I wish I could sell nearer home.

There are a good many colonies here in barrels, boxes, and hollow logs, and the owners never hear any thing about a standard hive or a bee-book.

Hamburg, La.

F. M. MORGAN.

Conversations with Doolittle

At Borodino

HOW TO TAKE CARE OF COMBS AFTER BEES HAVE DIED.

It looks as if I should lose some of my colonies before the honey season opens. As I am anxious to keep the same number, and perhaps increase somewhat, please tell me how to care for the combs and hives so that they will be suitable to stock up with again, either by having swarms or making colonies by dividing, etc.

If these hives and sets of combs are properly taken care of they can be used again. Many seem to think that, because the combs are somewhat moldy or spotted, they should be thrown away or melted up, and the hive scalded out or destroyed; but years of experience shows me that, with the loss of any colony during the winter, we have not suffered so great a loss as the first thought would indicate. If we do not lose more than one-third of the colonies, the loss is little more than the honey that these bees have consumed; for, with the remaining two-thirds of the colonies left, we can soon be back to where we were before, if the combs and hives are properly cared for.

The combs should be attended to in the early spring, before the weather becomes warm, otherwise they will become foul.

Of course, the bees will clean up very offensive combs; but by a little work on our part we can keep them in fairly good condition. The best way to store such combs is on long racks made of 2x6-inch scantlings, 12 ft. long, nailed on the under side of the roof of the store-room, the right distance apart so that the frames can hang on them as though they were in hives. By nailing these the right distance apart, after the first two are up, it takes only one more scantling for each row of combs. I formerly used inch stuff; but when these 12-foot spaces were filled with combs, many of which contained considerable honey, the supports were not stiff enough to hold rigidly without springing out of place under the weight, when the ends of the top-bars would slip off. Moreover, with several rows of combs the top-bars of the frames would have to rest one on top of another if supports one inch thick were used.

These long supports are much preferable to hive-bodies for holding the combs, as the air can circulate all through them, and any combs may be selected, and those empty or containing honey can be seen at a glance. Even if we never lose any colonies during the winter the idea is a good one, as the racks are so handy for storing extracting-combs or any combs which, for one reason and another, are not in use. However, if any one thinks otherwise the hives can be used. When any colony is found dead, carry the hive to the room, open it, take out the first comb, and, with a stiff brush-broom, sweep off all of the adhering bees and scrape

off all brace and burr combs from the top-bar and then it is ready to hang in the rack overhead.

For scraping frames and hives at a time when the wax and propolis are hard and brittle, I know of nothing better than an old chisel, the square corners being just right for all flat surfaces, and the cutting edge for cleaning out the rabbets on which the frames hang. After all the combs in the hives have been treated like the first one, scrape the empty hive to free it from burr and brace combs, knobs of propolis, or any thing else that would interfere with the easy handling of the frames of combs in the future. Especial attention should be given to both sides and bottoms of the rabbets. In storing away the clean combs they should not be pushed together as close as they would be in the hive, as the close spacing is a great inducement for the wax-moths, while the abundance of light furnished by the wide spacing keeps them away. Besides this, the wider spacing gives better circulation of air, and allows the combs to dry out at once—thus keeping them sweet and clean.

The hives I would store in an attic, piling them criss-cross, so the air may circulate through them; then by the time they are wanted, there will be no offensive odor, dampness, nor any thing of the kind about them.

It is well to make an examination as swarming time approaches, especially if the weather is very warm; for the wax-moths are always on the alert, and if the room where the combs are stored is dark, these insects may start to work sooner than we expect. My storage room has three windows, which makes it nearly as light as though the combs were out in the sun; and by keeping each comb an inch or so from the other, I have very little trouble. I am careful to use those combs first which show any indication of the moths, so there is never much damage done.

During a good yield of honey from fruit-bloom, any especially dirty combs may be cleaned up by removing one or two frames of honey from each strong colony and putting these dirty combs in their places. I am referring now to very moldy combs, those having dead bees packed in the cells, moldy pollen, etc. These should all have been kept by themselves. Such combs placed in strong colonies during fruit-bloom will be cleaned and transformed within forty-eight hours so that they can hardly be told from the best in the apiary.

Eight and Ten Frame Hives.

I have 23 colonies, 14 in eight-frame hives and 9 in the ten-frame, and find that the latter are by far the best. My strongest colonies are always in the ten-frame hives, and they make more honey than those in the eight-frame. Besides this, the colonies in the ten-frame winter better, and are stronger in the spring. After this I shall have ten-frame hives only, and the Hoffman frame is good enough for me.

Chickasha, Okla.

J. H. FLIPPO.

General Correspondence

THE ANATOMY OF THE HONEY-BEE.

Many of the Accepted Facts Shown to be Fallacies.

BY R. E. SNODGRASS.

What's the use of knowing so much, when so much you know ain't so?—JOSH BILLINGS.

For more than three centuries the honey-bee has been the innocent victim of the grossest kind of anatomical misrepresentation. No other insect has suffered so at the hands of unskilled dissectors, no other has been so maligned by unscrupulous artists. After looking over the great mass of published accounts and drawings purported by their authors or copiers to illustrate the structure of the honey-bee, and after comparing these with the actual parts of the bee itself, the writer here takes the occasion of assuring the bee-keeping public or any suspecting entomologist that the bee is not nearly so bad as it has been painted. The detailed results of this investigation have been published as a bulletin from the office of apiculture, of the Bureau of Entomology, of the United States Department of Agriculture (Technical Series No. 18). While full credit must be given to those authors of conscientious work who have described and figured what they saw, even though they did not see rightly, we can not condone the practice common among many writers on bees of making full descriptions, and especially complete pictures of things they saw only in part. While, perhaps, few writers have actually put into words *descriptions* of organs and structures they had not seen, few, on the other hand, have hesitated at publishing *pictures* of things they never saw clearly, or at filling in elaborate details from their imaginations. This attitude is hard to explain; for why is it not just as reprehensible to publish a drawing that depicts for facts things that were never seen as it is to describe for truth what one never saw?

When Swammerdam wrote about bees, away back in the seventeenth century, and drew pictures of their anatomy, he probably did the best he knew how to do or could do in his time and circumstances. But we can not see any excuse for some of the gross inaccuracies made by writers during the last fifty years, some of whose productions are so far from the truth that a mere mistake of observation could never account for them. For example, Samuelson and Hicks (*The Honey-bee*, 1860) represent the mandible of the worker as having a row of seven teeth on its cutting edge! Girdwoyn (*Anatomie et physiologie de l'abeille*, 1876) and Girard (*Les abeilles*, 1878) are responsible for some of the worst, and, at the same time, some of the most widely spread examples of ana-

tomical absurdities in pictures. The former wrote a pretentious memoir on the anatomy and physiology of the bee, accompanied by twelve large plates which received two medals at the time in Austria. This is the source of the much copied illustration of the respiratory system (see *The Honey-bee*, 1904, Fig. 27). Some of Girard's drawings are probably the crudest ever published in insect anatomy. In his book we find the original of that common picture of the bee's heart, which represents the latter as a pale band extending through the middle of a black field supposed to have the outlines of a bee's body (see *The Honey-bee*, Fig. 28). This is too ridiculous to deserve comment. It is safe to assume that the artist never saw the dorsal vessel of a bee. Girard's illustration of the sting is a design with absolutely no anatomical meaning, and is physiologically impossible. His pictures of the male and female reproductive organs, while crude, are better than some of the others, and are evidently taken from Clerici (*L'Ape sua anatomia—suoi nemici*, 1875).

To Leuckart we are indebted for several very instructive pictures of the interior of the bee. His combination drawing of the alimentary canal, the respiratory system, and the nervous system has been very widely copied. (See Lang's *Text-book of Comparative Anatomy*, Fig. 320; Packard's *Text-book of Entomology*, Fig. 426; Root's *A B C and X Y Z of Bee Culture*, page 11; Cowan, *The Honey-bee*, frontispiece; Cook, *Bees and Bee-keeping*, Fig. 27. Cowan copies a modification of the drawings from Witzgall, while Cook makes a modification from Cowan.) The picture, as just stated, is instructive in a general way; but the shape of the air-sacs and the disposition of the tracheal tubes are nothing like these organs in the bee itself.

The popularizing of any subject in science has always been a difficult task because the public wants something interesting to read, and the bare facts in most cases can not be made into entertaining literature; while, on the other hand, an embellishment of these facts by additions from the writer's fancy is not science. Of all the books written on the bee, there is no doubt that the first volume of Cheshire's *Bees and Bee-keeping* (1886) has done more than any other to popularize the subject of bee anatomy. But there is also no doubt that Cheshire was careless in his observation of details, and that he did not appreciate the true value of evidence. Therefore he was prone to build up theories on altogether too small a basis of fact. His work, however, is probably the most readable and the most read of all descriptions of insect anatomy. His pictures are good from an artistic standpoint, are intelligible, and have been widely copied even into purely scientific texts. Yet it will be evident to any one who carefully examines the internal organs of the bee in nature that Cheshire made little effort to reproduce faithfully the exact shapes of the organs and their parts. A scientific picture depends for effect upon

detail. This, Cheshire's illustrations have, but in far too many cases it is an artificial detail.

When a practical bee-keeper writes a book about bees, dealing principally with the methods of manipulation, he can not be expected to include any thing original on the subject of anatomy, and he would make a great mistake in attempting it. Hence we pass over the host of such writers who have taken their anatomical information from those who have pretended to make a special study of this subject, and who have credited their illustrations to the proper sources. But we can not understand how a professed scientist can write a book on the structure of the bee, and illustrate it with so many ridiculous drawings as occur to-day in one of the most popular works on the subject. It would not be so bad if the author did not pretend to have made a personal study of anatomy; but since we have reason to suppose that the author had at least looked inside of a bee, how then are we to explain his use of many drawings that give no conception of what the parts look like?

Let us examine a few of the figures found in this book. First is Witzgall's modification of Leuckart's combination drawing of the alimentary canal and the tracheal and nervous systems, on a black background. It may be enough to show two cylindrical air-sacs on each side and a number of tubes going off from these in the abdomen through the thorax and into the legs, and call it the tracheal system; but any one who has ever looked into a bee knows that the air-sacs do not have any thing like the shape shown in this picture, while a careful examination shows that the tracheal tubes are altogether different. Again we find an original drawing to illustrate the mouth-parts. The idea probably was to simplify the facts for the sake of "the student," for there are several drawings extant that might have been used showing these organs pretty much as they are in the bee. On another page we find Girard's illustration of the "aerating system." The artist may be credited with having seen two air-sacs in the abdomen, but he certainly did not see any thing else that he drew. However, the original author may not have known better; but we wonder how "the students" are reconciled to the absolute nonconformity between this picture of the tracheal system and that shown elsewhere. In another place we come to that masterpiece by Girard which shows the heart of the bee as a tube running straight through the body, and having swellings in the abdomen, thorax, and head. As a representation of the dorsal vessel of the bee this is an absurdity; but it is evident that it is intended for such by the black silhouette of a bee's body in which it lies. Now, how can an entomologist use a picture that represents the heart of any insect as widest in the thorax, and that depicts it as having two chambers in this region and one in the head? The statement in the text, that

"there are five ventricles," adds nothing that contradicts the falseness of the drawing. There is shown an original drawing of the sting and its larger poison-gland. Here, again, details are very greatly simplified, and things are shown as they do not appear in nature. Further along, we find Girard's picture of the male reproductive organs, probably taken from Clerici. There may be something present in this figure to represent most of the parts present in nature, but they certainly have no such appearance in the natural condition.

The wording of a text may be such that, while it gives little or no information, it at the same time avoids saying any thing that is untrue. On the other hand, in a picture every line drawn says something; and in a book purporting to give scientific information the drawings should tell the truth or else not be used.

The writer hopes that, after this brief review, the reader may be impressed with some doubt of the value of many published works on bee anatomy. On the other hand, many very excellent contributions to the subject have been made by scientific workers; but these do not come so often to the knowledge of bee-keepers. Such works are discussed and given full credit in the bulletin above referred to.

A secondary object of this investigation is to point out the limits of our actual knowledge concerning many of the common functions of the bee. In almost all cases the evidence is insufficient to warrant the acceptance of any particular theory or prevalent opinion. For example, nothing is yet really known about the process of digestion. Honey and pollen, which constitute the food of adult bees, are ordinarily supposed to be digested and even absorbed in the stomach. Cheshire says, "the chyle stomach is lined by an intima, or inner membrane, carrying a cell layer, the cells composing which appear to be of two kinds, having distinct functions, one secreting a digestive fluid (gastric juice) from the surrounding blood into the stomach, so that the contents of the pollen grains may be made fit for assimilation by a transformation not unlike that liquefying gluten in our own case; the other absorbing the nutrition as prepared, and giving it up to the blood—these cells representing the absorbent vessels of ourselves and higher animals generally." It scarcely needs to be pointed out that all this description is, most evidently, made up out of the writer's imagination. No kind of evidence is offered as proof, and the statement is a very fair sample of a great many of Cheshire's lucid explanations. They sound like descriptions of real facts, just as his drawings look like portrayals of real things. The present writer has found, from the examination of the contents of many stomachs, that there is much reason to doubt that either digestion or absorption of pollen takes place in the stomach. Honey and nectar may be absorbed from this organ, but the pollen certainly appears to be digest-

ed in the small or even also in the large intestine.

This subject of digestion leads to a discussion of the origin of brood food, concerning which writers on bee physiology are divided into two classes—one holding that this substance is produced in certain large glands situated within the head of the workers, the other claiming that it is formed in the stomach, and is simply regurgitated "chyle." On each side there seems to be evidence contradictory of the opposite view. In the first place, the mouth of the stomach is so constructed that regurgitation of its contents looks impossible; yet Schönfeld claims to have produced regurgitation by artificial stimulation of the stomach. The contents of the stomachs of bees examined by the writer, however, show no resemblance to the brood food or to royal jelly, being a dark brown mucilaginous slime containing pollen grains. On the other hand, Cowan points out that the work of Planta, showing that there is a constant difference in the food of the various forms of the brood at different stages, indicates that the substance is not produced by glands. Cheshire, after advancing his arguments in favor of the glandular origin, ends with the statement that "the naturalist will, in delight, realize that his bee is more a wonder of wonders than he had before imagined." But the days of delight in imagination are over, and we need some hard investigation of all the facts bearing on the subject before we can have any opinion worth having on the origin of the brood food and royal jelly.

Another of the "wonders of nature" usually pointed out in the bee is the so-called stomach-mouth, supposed to be for the purpose of taking the pollen from the nectar within the honey-stomach. Again looking to Cheshire we get the information that, "while the little gatherer is flying from flower to flower, her stomach-mouth is busy in separating pollen from nectar." This is a very pretty sentiment, but the author does not give us sufficient evidence as to how such hidden secrets were revealed to him. It is hardly enough to catch a bee in the field, cut it open, and see the stomach-mouth working, for it does this on any occasion when dissected from a freshly killed bee, whether there is pollen in the honey-sac or not. To the writer it seems much more probable that the stomach-mouth is simply an organ for passing any kind of food from the honey-stomach to the true stomach, comparable with the similar organ possessed by other insects, rather than a special structure of the bee for separating pollen from nectar.

These are but a few of the problems directly suggested by a study of the anatomy of the bee. A thorough knowledge of anatomy is, of course, fundamental to a study of physiology, and a knowledge of physiology is again most essential in the investigation of all forms of diseases—a subject of vital importance to all bee-keepers. If we add to these subjects a study of the senses

of the bee, its behavior, and its place in nature, the field for future work enlarges without limit, and the student realizes that a lifetime might be spent in exploiting this small insect. Since, however, all of us seem to prefer to do several things in a lifetime, it is evident that it will require several investigators to find out yet all there is to know about this already much studied creature, the honey-bee.

Washington, D. C.

A STANDARD HIVE.

The Ten-frame Hive Used in New Zealand Exclusively.

BY I. HOPKINS.

I was much pleased, Mr. Editor, in noting your remarks on this subject in your issue for Nov. 15, and quite agree with you as to the great advantages that would result to bee-keeping in your country could a standard hive be adopted. There has been sufficient time to test the various forms of frame hives that have been in use since Langstroth gave us his, and I don't think there would be any difficulty, at the present time, in deciding which is the most convenient and best. The advantages of having one form of hive in use are so many and so great that I think it folly not to use every endeavor to bring so desirable a condition about. It is a national and an urgent question, and therefore comes properly within the scope of your National Bee-keepers' Association, which, in my opinion, is the right party to deal with it.

You, Mr. Editor, are not altogether blameless for the present condition of things as I see them. It seems to me that you have been too ready to publish illustrated articles on so-called improvements from inexperienced contributors which were any thing but improvements; and the fact of your publishing such articles under big headlines has given them such prestige that, no doubt, many beginners have accepted the improvements (?) as the latest thing out. It is usually the inexperienced who bring forward the doubtful improvements.

In speaking of the advantages of having but the one form of hive, I do so from some experience. It was my good fortune, in 1877 and '8, after experimenting for some years with various forms of primitive hives, to obtain a copy of Langstroth's "Hive and Honey-bee." After some little study I concluded the ten-frame Langstroth hive was just what I needed; and after a season's experience I felt quite satisfied with my choice. At that time there were no frame hives but my own in use in New Zealand. Shortly after, I contributed a series of articles on modern bee culture to two leading daily papers, always advocating the ten-frame Langstroth; and in 1881 I published the first edition of my bee manual in which I gave full instructions for making it, and compared

by diagrams the Langstroth frame with the Quinby, open and closed end; Adair; American; Gallup, and Abbott's Standard.

Being, as it were, forced for the time into the supply trade, as well as running a bee-farm, I made none but the ten-frame hive; and in later years, when I was asked by new arrivals from England to supply them with the British standard hive, I always suggested such a prohibitive price that they were forced to accept the only hive then made, and in most cases they afterward acknowledged they were pleased. I was frequently asked to make the Heddon (which I had tried myself); the Danzenbaker when it was boomed, and other hives of different dimensions; but I always asked too big a price. My friend Mr. Brickell, at Dunedin, also acted similarly, so that to-day I do not personally know of one single hive in use in New Zealand other than the Langstroth, and, with one exception, they are all of ten frames. In the case of this one exception, the owner told me that, were he starting again, with the knowledge he has gained, he would give up the twelve-frame hive for the ten.

I believe that New Zealand is the only country in the bee-keeping world in which the one frame and the one hive are used throughout; but I can assure you, Mr. Editor, it took some fighting through the press to keep this condition of things, and there is no fear now but that it will remain so.

Manufacturers need keep only one kind of hive and frame in stock, with extractors and other appliances suitable for it, therefore they can be sold cheaper on that account. Knowing from experience how great are the advantages, I can only hope that you will awaken such interest in the matter as to bring about, sooner or later, the adoption of a standard hive.

Auckland, New Zealand.

TEMPERATURE OF BEE-CELLARS.

Weak Colonies Successfully Wintered in a Cellar where the Thermometer at Times Stood at 33° F.

BY F. L. POLLOCK.

It has been frequently stated that a temperature in a bee-cellar averaging lower than 40 is almost sure to result in the loss or weakening of colonies. With regard to this, an experience of my own in the winter of 1909 may prove interesting.

My cellar is about 16×20 feet, under my house. It is floored with brick, and the walls are merely boarded against a heavy clay soil. It has two windows, both banked with earth in the winter, and it is entered by a short flight of steps from a board woodshed where the temperature stands about the same as out of doors.

Nov. 2 I placed nine colonies in this cellar. All these were weak, none having bees enough to cover more than four combs, and

all were short of stores. The hives were blocked up an inch from the bottom-boards, front and rear, and were placed on stands about two feet high. The brood-chambers were not contracted. Each colony was given a cake of hard candy weighing three or four pounds. This was laid flat on the top of the frames, and warmly packed with paper and cloths, and a telescope cover placed on top of all. Fruit and vegetables were kept in the cellar, so that some one entered it several times every day with a light, letting in a rush of cold air, for the door opened practically out of doors. During November the thermometer averaged about 40. In December it sank to an average of 38, and remained so during January. February was a cold month, with outside temperatures falling frequently below zero, and several times as low as 10 below.

In the cellar the mercury hovered about 36, and two or three mornings I found it down to 33. I tried placing a very large lamp on the cellar floor, which brought the temperature up two degrees; but I decided that this was useless, since not only did the light disturb the bees, but as soon as the lamp was removed the temperature crept back to where it was before.

I had very little hope of bringing my weak colonies through. March, however, turned out unusually mild, and the cellar rose gradually to 40° again. All the colonies were still alive; but I felt sure that they must have dysentery or something, though I could see no sign of it, and I set them outdoors as early as I dared, April 3.

Now, every one of those nine colonies seemed as strong as when I put them in the cellar. The worst sufferer had not more than half a pint of dead bees on the bottom-board, and most of them had merely a handful. They had consumed almost all their candy, but not much of their honey stores, showing, I think, that the cluster had been unable to move freely, and had fed upon what they could most easily get at. No queens were lost, and there was no trace of dysentery.

I can attribute this successful wintering to only two things: First, the candy stores; second, the fact that the cellar door was opened so frequently that there was a plentiful supply of fresh air. The conclusion would seem to be that proper stores and ventilation are more important than temperature—at least, within certain degrees.

It appears that cellar-winterers in Canada do not demand as high a temperature as seems to be required in Ohio. One of our most successful bee-keepers considers a temperature of 36 to be about right, claiming that the bees remain more dormant, using less vitality, and coming out better in the spring.

This winter I have 22 colonies in the cellar, all of them stronger than the ones I have mentioned, and with their combs full of sugar-syrup stores. I battened up doors and windows, and went south to spend the winter. The temperature will be higher,

but there will be less ventilation. I am quite anxiously awaiting the time when I can return to learn the result.

Stouffville, Ont., Can.

[A small number of colonies will often winter well in a cellar when a large number would come out in the spring in very poor condition. A cellar 16×20 would ordinarily be considered of good size; when, therefore, you place only 9 colonies in that cellar you have a number so small that they could hardly befool the air, especially when you open the cellar frequently. Such a small number could stand a much lower temperature (because of the comparatively good air) than a large number with poor air.

You will probably find that, during this winter, the larger number will not come through in as fine condition, and we would, therefore, be glad to have you report the results in the spring.

No, temperature is not as important as ventilation. With good ventilation the bees can stand considerable range from a high to a low and from a low to a high temperature; but when the air is fouled by the breath of a large number of bees, too warm or too cold an atmosphere is apt to cause disastrous results.

The general verdict of bee-keepers over the country is that from 43 to 45 is the best temperature for a bee-cellar; and if that temperature can be maintained between 40 and 48 in a reasonably dry cellar supplied with fresh air, the bees (other conditions being equal) should come out in fine condition.—ED.]

SOME COMMENTS ON DISCUSSIONS AT RECENT CONVENTIONS.

Advertising Honey.

BY F. GREINER.

The turning of our product into cash, and obtaining the best possible price, is one of the things uppermost in bee-keepers' minds. Speaking of extracted honey, one of our friends at the Geneva convention said: "Because we ask so *little* for our honey, people are forced to think it is not worth much. An opposite policy followed would produce the opposite result." Others entertain the idea that the people are not acquainted with the article, and therefore do not use it. Advertising is recommended. Educating the public by advertising, and setting forth the high qualities of honey, would undoubtedly have a beneficial effect. Such advertising as is done along the line of breakfast foods, soaps, etc., is, however, all out of the question, because no one bee-keeper can be expected to do this, on account of the tremendous sums it would require. All bee-keepers together can not do it, because they can not be united. A cheaper way of advertising must, therefore, be resorted to, which, however, will not prove nearly as effective. The New York State Bee-keepers' Associa-

tion has decided to have school-pads made, the front pages of which contain matter relating to bees and honey. I would suggest that it be principally *honey*. We don't care to interest the people so much about bee culture as we do about the product.

As a means for making people better acquainted with honey, it was suggested and urged to make more elaborate exhibitions at fairs. Instead of occupying a little side table in the great exhibition building in Syracuse we ought to fill the whole room now generally occupied by fruits and vegetables. This could be done, and the impression created that there is honey without end in the State. This would cost the bee-keepers a great deal of money. But few exhibitors could obtain a premium, and all the reward they might get would be, perhaps, the chance to sell their honey. If it were noised about by advertising that all of New York honey was to be on exhibition at our State fair, buyers might flock to Syracuse, and, in course of time, regularly make their purchases at this time. We must not leave out of calculation that each exhibitor has to pay a big entrance fee, which might prove more to the advantage of the agricultural society than to the exhibitors. On the whole, the scheme looks doubtful to me.

A better distribution of our honey, and also of many other agricultural products, would probably raise the prices; but the higher the price is, the less will be consumed of those articles which can not be regarded as necessities; and when honey goes above a certain proportionate price, other sweets are given the preference. All theorizing will not alter this fact. I believe in every laborer receiving fair pay for his work, and it strikes me that the bee-keeper is doing as well as laborers employed in other fields. There is a decided aversion here to paying more for honey because "the bees work for nothing and board themselves." (?)

DISEASE ON THE INCREASE.

The next subject, and one of gravest importance, is foul brood. No bee-keepers' meeting has been held for the past ten years here without this subject taking up a great deal of time. When the European disease was first discovered in our State it was found present in four or five counties. The bee-keepers hastened to inaugurate a measure to stay the spread of the disease, and four inspectors were appointed by the State to confine and stamp it out. Year after year we anxiously asked the inspectors, "What about foul brood?"

"Oh! we have it under control," we were answered; but after ten years of efforts on their part, with the help of one of the bee-keepers, the disease is now in almost every county in New York; and we heard some one say at the National meeting in Albany, "The time is near at hand when *every bee-keeper* will have the disease in his yard." This is discouraging news; but if this is a fact, it will be well for us to prepare for the worst. The Seneca Co. bee-keepers are having a taste of the disease just now. They

have lost heavily already, and they say the shaking plan did not save them, but cost them lots of money.

Mr. J. T. Greene told us at the Ontario Co. meeting that he expended \$750 a year ago on Italian queens and comb foundation. The disease, however, reappeared in the shaken swarms, and he is pursuing different methods with better results, but finds it absolutely necessary to use young Italian queens in connection with his treatment. Only such combs are destroyed as are very badly affected; the rest are placed in upper stories over excluders, queens left below. After ten days the brood-combs are returned. By that time the combs have been cleaned out. It will generally become necessary, when foul brood makes its appearance, to reduce the colonies in numbers, uniting two or more till a good force of bees is at hand in every hive. Following this method of treatment he succeeded this past season, so that he could sell \$2000 worth of honey, with his bees much improved, though not entirely cured. Mr. Greene is preparing to rear his own queens next season, although he says that queens can not be reared in colonies affected with European foul brood; but queens reared in foul-brood-affected vicinities may be better—the theory being that the bees become more and more immune, only those surviving that are most disease-resisting.

WINTERING IN SINGLE-WALLED HIVES.

The subject of wintering has also not entirely lost its interest among the bee-keeping fraternity. There were several at the New York State meeting, as well as at the Ontario Co. meeting, who had come to the conclusion that chaff hives are not needed for outdoor wintering—in fact, they preferred the single-walled hive with a good packing of forest leaves on top of the brood-chamber, and no sealed cover. Mr. H. L. Case went so far as to say that he would give more for a colony in a single-walled hive thus prepared than for one in his large cumbersome Quinby hives, other things being equal. Dr. Schamu was a second to him. However, there was some opposition. Mr. Howe came out strongly on the other side, claiming that, in his northern clime, bees could not be wintered out of doors by any method with any degree of safety. Some years they might winter, and some they would not.

I once visited Mr. Howe's bee-cellar after the bees had been in it several months. It was in March, and the bees were very quiet, the hives clean. We "poked" around among the hives for a half-hour without the bees becoming in the least disturbed. We even turned some hives up to observe the color of the bees, etc. Mr. Howe's bee-cellar is under his dwelling; has a cement floor, ventilation through a tube upward; no special provision is made for the incoming of fresh air. There were 275 colonies stored in it; passageways were left between the rows of tiered-up hives. Most hives were painted, but some were not. The fact

that the large stock of new hives was painted or being painted shows that he considers it best to paint. The bees have usually wintered well in this cellar.

OBTAINING A LARGE NUMBER OF QUEEN-CELLS CHEAPLY.

We seldom hold a bee-keepers' meeting when the subject of queen-rearing does not receive its share of attention. Mr. Case gave his rather novel plan of having quantities of fine queen-cells built. It was given a year ago as well as this year at the Ontario Co., N. Y., meeting. The plan is this: A nice clean comb is given to the breeding colony. Four days later the comb, then full of eggs and larvæ, is prepared in a warm room as follows: With a knife incisions are made with the rows of cells, to the midribs, all over the comb. Then with a chisel every other strip is removed, leaving the rows of cells separated. In every row thus left, every other cell is destroyed with a match. Thus prepared, the comb is given to a queenless and broodless colony above the top-bars of frames horizontally supported with space enough to allow for the queen-cells to be built. The bees take very kindly to such an arrangement, he says, and build a great many fine cells (he has had 75 built on one comb at one time). It beats the larva-transfer method "all hollow." The writer of this believes the above a very good plan where one needs many cells at a time. Dr. Phillips, of Washington, gave very much the same method of producing queen-cells, at our State meeting in Geneva, Dec. 12, 1910.

A QUICK WAY OF FINDING QUEENS.

Having so many cells to dispose of, it will be necessary to find many queens, and a quick systematic method for finding them will be welcome, particularly with black and brown bees. The Hannemann method of running the bees through a sieve recommends itself. Mr. H. L. Case and the inspectors in our State employ it. They shake the bees off their combs into a box with a perforated queen-excluding metal bottom reaching partly up the sides. The box (or sieve) is placed in front of the hive entrance. The one I have used stands on short wire legs. The bees, when dislodged from their combs, climb hastily through the perforations and back into their hives. The drones with the queen are left behind. Mr. Case says he finds a queen every five minutes with this arrangement. I would say I have also used an entrance-guard for the same purpose, but the bees are then a good while longer getting back into their hive than they are with this sieve.

Naples, N. Y., Jan. 13.

Odor of Tobacco from the Cigar-box Killed the Bees.

Referring to the bees in the cigar-box, p. 52, Jan. 15, surely the odor of tobacco killed the bees. I had the same experience. Don't go hunting bees with a cigar-box either.

Rolle, Pa.

J. WHEELER.

BEE-KEEPING IN THE HIGHLANDS OF MEXICO.

Carl Ludloff and His Simplex Hive.

BY O. B. METCALFE.

Returning now to Mr. Carl Ludloff and his Simplex hive, as he is now manufacturing it for sale and his own use at Irapuato, Mex., we have a very good picture of Mr. Ludloff together with his home apiary of Simplex hives. The man in the background is his Mexican helper, who works for the small sum of 75 cents per day and boards himself. I could plainly see that he was nothing but a helper in the real sense of the word; but, even as such, when one considers that his pay is the equivalent of only 37½ cents U. S. currency, it certainly is cheap labor. Plenty of such labor may be had, and even cheaper, in Mexico.

A glance at Fig. 8 suffices to show that this apiary is kept in perfect order. Every thing is neat, clean, and orderly, each hive being well made and perfect of its kind. Seeing this I expected to find the inside of the hives well kept, and so it turned out. While in the apiary with Mr. Ludloff we opened a number of hives, and every one of them showed careful manipulation and a thrifty condition of the bees. On the hive just in front of Mr. Ludloff a little slat can be seen, and on the back of this a small piece of paper. This is one of his score-cards, and each hive has one on which a record is kept of what it did all through the season.

Fig. 9 shows three of these Simplex hives. The first and second ones have the shingle water-sheds removed in order to show the cattail-flag mats in position, while the third has this mat removed to show the frames serving the double duty of frames and inner hive walls. The two end frames are filled with matted bullrush about one inch thick, so as to form ends for the hive. Each hive has 17 frames and 2 division-boards, which are used to contract or expand the space occupied by the bees to suit the size of the colony. Thus if a colony needs one or two more frames the division-board is moved over a frame or two. In size the frames are 10×15½ inches, inside measurement, and of a thickness to take one-pound sections. Each frame holds eight sections; and when the apiarist wishes to run for comb honey he places several frames with sections on either side of the brood with one frame of solid capped honey between the sections and the brood.

In sections Mr. Ludloff uses foundation starters, but nothing of the sort in his brood-frames. In these he uses what he calls a wire starter. This wire starter he makes by stretching a single strand of No. 30 tinned wire across the top of the frame within ¼ inch of the top-bar. He claims that, without fail, they will start the comb along this wire, and I am inclined to believe that it would work in most cases, for I have often

noticed that the bees draw combs straighter in wired frames than in those without wires, and that they are fond of starting comb any place along horizontal wires. Some will wonder what object there is in finding out new things about starters when every one knows that it pays to use full sheets of foundation. But I doubt if full sheets would pay in most places in Mexico. I certainly was surprised to see how little drone brood Mr. Ludloff has in his hives. I could not understand it until he afterward told me that he never kept a queen more than one season.

Fig. 10 shows a Simplex hive opened up, with a good covering of bees on the brood and honey. It also shows one divisible frame, which is used for making increase, or for sending a small nucleus by express. The entrances, as can be seen in the cuts, are very small; but Mr. Ludloff keeps even these half stopped most of the time, and claims that the lack of ventilation is one of the strong points in his hive for his location.

To describe in detail the operation and the many advantages Mr. Ludloff claims for his Simplex hive would take much space. In a few words I will tell how the hive impressed me. I feel that it has the good points of being warm and of being easy to handle or manipulate so far as working in the brood-nest is concerned, and that it is evidently cheap of construction. But it seems to me that it would "fall down" in that the place for storing surplus is not above the brood-nest; for, if I understand the bees' nature, they will store honey above the brood-nest further from it without swarming than to one side of it, because the heat which rises from the brood-nest can be used in working the wax. Furthermore, while the manipulation of brood in the Simplex hive would be very easy I do not think the taking-off of honey would be as easily done as in our standard American hive with its super for surplus. However, because of the very high price of lumber in Mexico, and because of the high duty and freight charges on our American hives, the Simplex hive may be the practical one for that country; but I feel sure that the merits of the former as an ideal hive do not justify Mr. Ludloff in the bitter impeachment he is waging in Mexico against them.

Mr. Ludloff claims that his flow often shuts off very quickly, and that severe robbing is the result. For this reason he has made a bee-tent of canvas as shown in Fig. 11. Two men can carry it any place with little or no effort, and it looks as though it might be pretty handy and comfortable. It affords a shade as well as protection from the robbers, and has a rack around the walls to hold tools while moving from one hive to another or when not in use.

The queer cylindrical hive shown in Fig. 12 is the kind used by the Mexican bee-keepers around Irapuato. They are mostly kept suspended under the eaves of the houses, and the honey is taken from them in the



CARL LUDLOFF AND HIS SIMPLEX HIVES.

same manner as their brother bee-keepers take it from the yucca-trunk hives around Tampico. It is made from slits of bamboo, woven basket fashion, and is plastered over with a coat of mud to keep out the air.

CONDITIONS IN MEXICO AS A WHOLE.

Summarizing my trip of investigation through Mexico I will say that I do not intend at the present time to locate any bees in the republic on the strength of any thing I saw; but I wish to call attention to the fact that I did not visit the low and strictly tropical regions. I was told that one could buy bees in yucca-trunk hives around Tampico for a dollar a stand. There might be some money made there buying them and working exclusively for wax; but I would advise any one interested in this sort of thing to go and thoroughly investigate it before closing out any bee-outfit he already has. I had read and had been told that living is very cheap in Mexico, but I did not find it so. I got double the number of dollars when I changed my money at the line, but it went about twice as fast; and with many of the common articles of food, two dollars in Mexican money will not buy as much as one dollar will in the United States.

Mesilla Park, N. M.

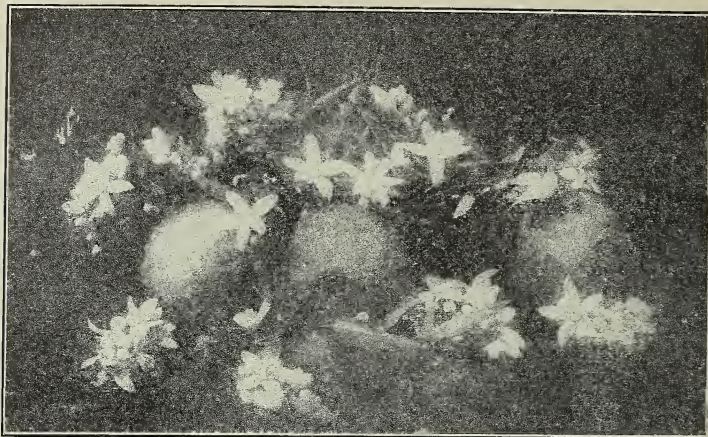


Fig. 17.—Cluster of orange-blossoms and fruit.

BEE-KEEPING IN FLORIDA.

The Surplus-honey Sources.

BY E. G. BALDWIN.

Continued from last issue.

While in a general way the northern half of Florida (see map) is the land of the pine, and the southern half the land of the palm, the dotted areas will give in a more comprehensive way the sections of the various honey-producing sources. Of the fifteen odd sources of possible surplus honey, a glance will reveal the truth of the claim that the large majority of them are trees, not plants. Name any other State of which this can be said.

These, considered singly and in their seasons, are about as follows:

1. Wild pennyroyal (of the mint family); grows in the southern half of the State, blossoming in January and February. The honey is clear and of good flavor and body, but the yield is slight, as a rule, nor does it figure very largely in the honey put on the market. Weather is apt to be uncertain while it is in bloom.

2. Titi (*Cyrillaceae*, or titi family). An evergreen that grows in pine swamps in the northern portion of the State; gives surplus only in the extreme northwest in the so-called West Florida. It blos-

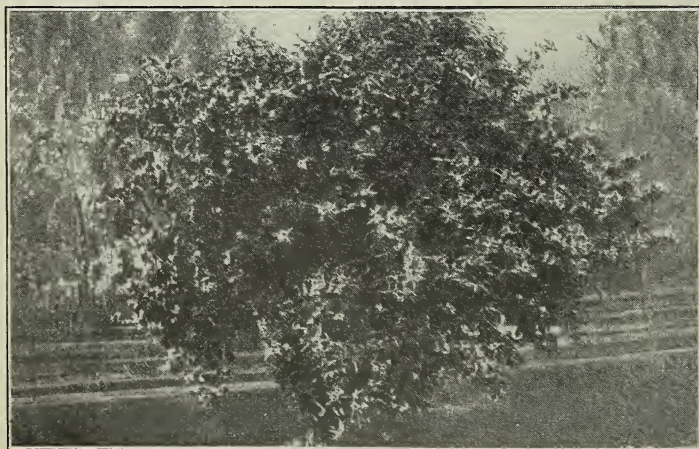
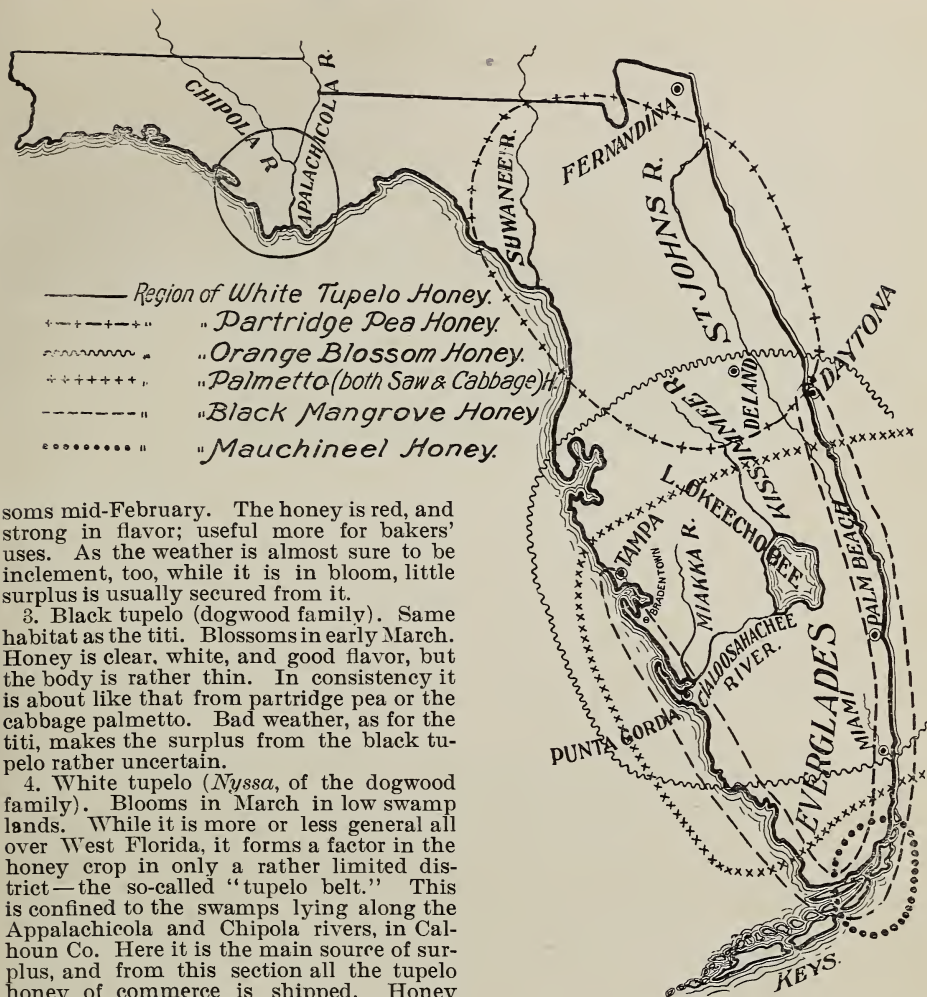


Fig. 27.—Orange-trees produce the finest honey in Florida when taken pure. When conditions are right the nectar can be seen shining in the blossoms.



soms mid-February. The honey is red, and strong in flavor; useful more for bakers' uses. As the weather is almost sure to be inclement, too, while it is in bloom, little surplus is usually secured from it.

3. Black tupelo (dogwood family). Same habitat as the titi. Blossoms in early March. Honey is clear, white, and good flavor, but the body is rather thin. In consistency it is about like that from partridge pea or the cabbage palmetto. Bad weather, as for the titi, makes the surplus from the black tupelo rather uncertain.

4. White tupelo (*Nyssa*, of the dogwood family). Blooms in March in low swamp lands. While it is more or less general all over West Florida, it forms a factor in the honey crop in only a rather limited district—the so-called "tupelo belt." This is confined to the swamps lying along the Apalachicola and Chipola rivers, in Calhoun Co. Here it is the main source of surplus, and from this section all the tupelo honey of commerce is shipped. Honey from the white tupelo is almost white, with just a tinge of lemon hue in the sunlight that is very beautiful. The body is thick and the flavor is exquisite. It reminds one of the "smack" of "bumble-bee honey" of boyhood days; and that is a high compliment too, let me hasten to explain to those who have never been so fortunate as to remember how that tastes. Some would pronounce it even superior to that from the saw palmetto or mangrove. Tupelo honey, we are glad to say, is now sold under its own name. Seven years ago the writer tasted some so-called tupelo honey in the office of Mr. J. H. M. Cook, in New York, which he now knows was *not* pure tupelo honey; for the *pure* article will not granulate, and that was candied hard. By the way, that particular honey had been sold to Mr. Cook as "orange honey," just because it came from Florida and the name was suggestive. Tupelo honey needs no such recommendation now. I am indebted to Messrs. Higgins and Hollinger, of Wewahatchka, West Fla.,

for a sample of pure white-tupelo honey, and I must pronounce it about as fine an article as I have ever sampled.

5. Orange-blossom honey (all of the citrus family). The best sections of the State for this tree are from the north-central portion to the southern end of the peninsula. It blossoms in late February or early March. There is no more beautiful sight nor sound nor odor than an orange-grove in full bloom, the air redolent of perfume, and the air alive with humming, toiling bees amid the snowy petals (Fig. 17) that shine like stars from out the masses of shiny green leaves. See Figs. 27 and 29 for good illustrations; but no picture can do justice to the reality. The honey is light amber, clear, and almost transparent—clearer than that from saw palmetto, though the body is not quite so heavy. The flavor is delightful; "fruity" is about the term for it; the aroma of the blossom is in it—a perfume not found in any other honey I have ever tasted. I once



where there are extensive groves and nothing else to bloom at the same time, or its color is darkened and its flavor changed by the admixture of poorer grades from other sources." For example, the wild cherry blooms profusely in almost all orange-growing sections, and about simultaneously with the orange. Again, the orange-tree yields nectar profusely

sent a sample of this honey to Mr. Ernest R. Root, who replied as follows: "We are inclined to think the flavor is a little finer than any thing of the kind we have ever tasted." Of course, this means *pure* orange honey. It is not easy to secure it in a pure state. Mr. W. S. Hart, of Hawks Park, Fla., says in the *Irrigator*, page 373, Vol. II., No. 12, "Pure orange honey is unexcelled in color, body, or flavor; but it is and always will be scarce, as it can be got only

only about two years in three. Even when it does yield, it is an extremely difficult thing to get colonies up to proper super-strength in time for the flow. No; pure orange honey will never become a glut on the market. There is this additional difficulty that bee-men in this particular section have to contend with: Our summer honey is dark and strong. Unless all this honey is taken out of the combs by the time orange begins to bloom, some of this dark



Fig. 29.—Orange-grove in full bearing, De Land, Fla. The fragrance of the blossoms comes from the honey.

honey is sure to be carried up into the supers, when the queens commence to "spread themselves" in egg-laying. It does not take much of the dark honey to mar the flavor and dull the color of the choice orange honey. As a rule, orange honey does not candy easily. The past year was a marked exception to the rule, however. It is probably due to the other honeys mixed in with the orange.

6. *Andromeda* (a scraggy shrub of the heath family). Blooms in the central and northeastern part of the State for about four weeks in March and early April; yields but little three years out of four. The honey, too, is reddish yellow, thick and pungent, not very valuable as a surplus-honey plant.

7. *Gallberry* or *holly*; a tree that grows in almost all parts of Florida. The northern portions, however, are more suited to its best growth. Blossoms anywhere from mid-March to early May, depending on the season and the latitude, but almost always along with other honey-bearing sources, so that the honey is practically never obtained pure. For example, on the east coast, in the neighborhood of Daytona, it blooms along with the saw palmetto, and the resulting honey is a blend of both. Both happen, luckily, to be good in flavor and alike in color, so that the result is satisfactory. Were it not a fine honey it would ruin many a ton of choice palmetto honey. Even where it is not sufficient for surplus, it comes at a time favorable for breeding up colonies for coming harvests of other sources. When bees are working freely on the gallberry their hum can be heard for many yards in all directions. It is my observation that the male holly seems to yield even more abundantly than the female.

8. *Saw palmetto*, commonly dubbed "scrub" palmetto (*Serenoa serrulata*); a shrub with creeping trunk, leaves erect and fan-shaped, often standing six or seven feet high. It thrives on sandy soils, moist preferred. Hummock lands are best for its growth. It blooms from April, in the south, to June in the northern sections of its habitat. The blossoms are small, greenish-white, arranged on a plume-like stem that grows out from a central bud in the head of the plant, at the base of the leaves. They are fragrant, though not so large and showy nor so aromatic as the blossoms of the cabbage palmetto. The honey from the saw palmetto is lemon-yellow in color, thick and waxy, and of pronounced but delicious flavor. Is not quite so transparent as pure orange honey, but seldom candies, and makes a choice table article. Mr. O. O. Poppleton pronounces it the best honey in Florida, "with possibly the exception of tupelo." It is liked by almost every one at first taste; is a trifle milder than even orange. My friend Mr. Harold Horner, Philadelphia's most energetic honey-dealer, tells me that he prefers it to all other honeys from this State.

He has bought it for years past. Forest fires often damage wide tracts of this most valuable bee forage, though only for that year. This will be referred to later under "Difficulties of Florida Bee-keeping."

De Land, Fla.

To be continued.

BEE-KEEPING AS A HOBBY.

Tools and Dress.

BY F. DUNDAS TODD.

Chapter Five.

The tools essential for the practice of bee-keeping in a small way are neither numerous nor expensive, consisting practically of a smoker and a hive-tool. As the latter may be dismissed in a few sentences we will speak of it first. Its principal use is to force apart the frames in the hive which are generally glued together by the adhesive mentioned in the previous chapter—its name, by the way, being "propolis." As any

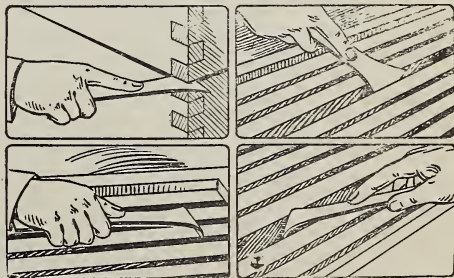


Fig. 1.—Nickered-steel hive-tool.

piece of strong light metal is fit for this simple work we find many bee-keepers content to use a screwdriver or inch wood chisel. But once in a while we need something to scrape away the accumulations of wax and propolis from the frames, or the deposit of dead bees and other waste matter on the

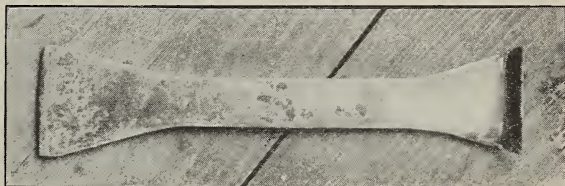


Fig. 2.—Hive-tool, one-third actual size.

bottom-board, and then we need something different. Many hive-tools have been invented; but after trying most of them the writer pins his faith emphatically to the one illustrated in Fig. 1. All the uses to which it can be put he has not yet discovered, for it is as handy as a bench-tool as for the purpose for which it was specially designed. The lower figure in the cut shows it used for scraping frames; the upper, how the flat end is inserted between two hive-

bodies to break propolis connections. The rounded shoulder at this end is just the thing to get leverage when prying frames apart.

THE SMOKER.

Any one who has ever indulged in the excitement of a combat with even a single bee would be apt to think that the word "fear" did not occur in her vocabulary, and that no power on earth could bring her to subjection. But even the bee has her moments of weakness, though the writer can not for a second admit they are due to a streak of cowardice. It seems to be rather complete indifference to immediate surroundings while she is making provision for a great calamity that is impending. For countless ages the natural home of the colony bee has been in the hollow trunk of some monarch of the forest where the most terrible fate that could threaten would be destruction by fire. It seems to the writer that, as a consequence, there would be developed an instinct in the race that, on the first hint of smoke, would make each bee gorge herself with honey preparatory to a general flight to some safe region where the work of the colony could be resumed. When, therefore, we wish to enter a hive we force smoke into the interior. On opening it we find most of the inmates with their heads in the cells lapping up honey, and more or less indifferent to the monster who is invading their home. In times not so very long ago, beekeepers used very crude methods for driving smoke into a hive, such as burning rags or rotten wood in an open pan, and blowing the smoke into the chamber with breath from the mouth. By a happy inspiration Moses Quinby combined a bellows with the holder for the burning material, and paved the way for the smokers of to-day, one of which is shown in Fig. . Essentially it consists of two parts—the bellows and the stove. When the former is quickly compressed it forces air into the stove under the grate on which rests the cotton or linen rags (never woolen), rotten wood, pieces of old discarded hive-quilts coated with propolis, oily waste, or short lengths of well-dried

fruit-tree prunings; in fact, any thing handy that will smoulder slowly and give off pungent smoke. The best substance the writer has ever used is greasy waste. Enough of

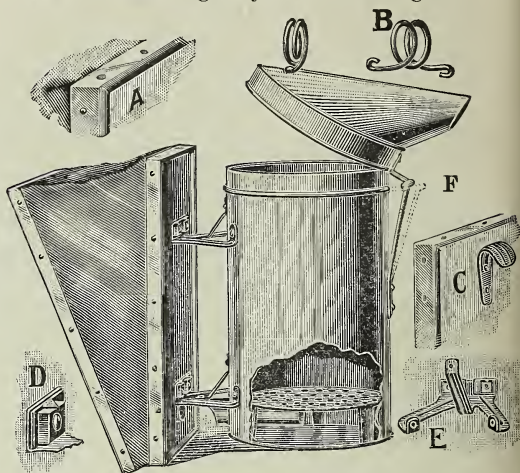


Fig. 3.

this to last for a whole season may easily be had for the asking where a steam-engine is used. The current of air drives a volume of smoke through the nozzle into the hives or across the frames as may be desired.

COSTUME.

There is nothing very stylish about the raiment recommended to be worn while one is working in the bee-yard. Like that of many other pastimes it is peculiar to itself, consisting essentially of hat, veil, and gloves; but, though the head gear is generally of ample dimensions as regards the brim, it can not be grouped among the "merry widow" type, nor can the veil be deemed a variety of the "automobile" style. The gloves may or may not be worn. Bee-keeping is like golf in this respect, for no particular regulation prescribes the proper dress wear for the hand. The brave baron of old worked up quite a reputation for cour-

age by killing off miserable wretches on foot whose sole protection was a leath-jacket, while he himself was mounted on a horse which, like the rider, was encased in steel. His long lance drilled a neat hole in the skin of the foot soldier whose short



Fig. 4.—Two different types of smokers, the hot and the cold blast. The hot blast is to be preferred, because it is much more efficient.



Fig. 5.—Ordinary black net bee-veil with rubber cord around top and bottom.

spear could not reach even as far as the horse's nose. The twentieth-century successor of the warrior bold of the Dark Ages is the bee-keeper. He wisely envelops himself in a coat of mail impenetrable to bee-stings, then attacks the horde with a smoker. He differs from the baron most honorably in one respect—he does not give donations to wandering minstrels for composing lying lays about his courage.

HAT.

Any old hat with a fairly broad brim is good enough for bee-keeping providing there are no holes in it. The wide brim keeps the veil away from the wearer's face and neck.

VEIL.

The veil problem is one that most men must settle for themselves—at least, that is the experience of the writer. He began with the ordinary veil shown in Fig. 5, but found it very unsafe, as holes were continually appearing in it. Now many old-time bee-keepers are perfectly satisfied with this form of protection, so it must be safe enough for careful people; but the writer may belong to a different class. Besides being about six feet in height, he is continually bumping his head against such simple things as

branches, which a shorter man can miss without any effort. Men of the modest stature of five feet and some inches generally prune fruit-trees to clear their own height, and then wonder why a big fellow can not take care.

The Alexander bee-veil shown in Fig. 6 looked hopeful when it first appeared, and so one was made. It is assuredly a perfect protection from bee-stings, but the writer's head never seemed to get accustomed to it. He felt its presence too much all the time. One great merit almost reconciles him to it, however, and that is the wonderful freedom from forehead perspiration in hot weather

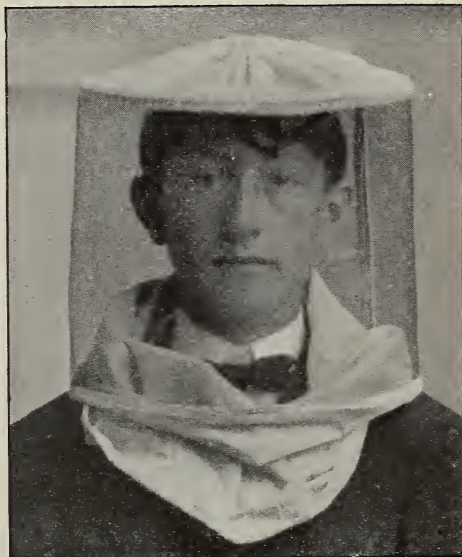


Fig. 6.—Alexander bee-veil.

when it is worn—no mean advantage, as will be appreciated by those who must wear spectacles. A hat-band is a great producer of perspiration, which soon runs down the brow and spreads itself over the lenses of the spectacles, blurring vision completely. Such problems as these rather complicate one in the choice of a veil. In the writer's case he decided that ready access to his glasses

was of more utility than the almost entire absence of streaks of sweat on them. Hence he prefers the Coggshall bee-veil and suit shown in Figs. 7 and 8. This consists of a blouse to

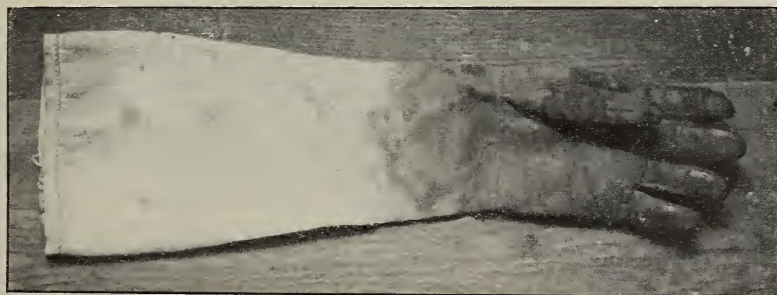
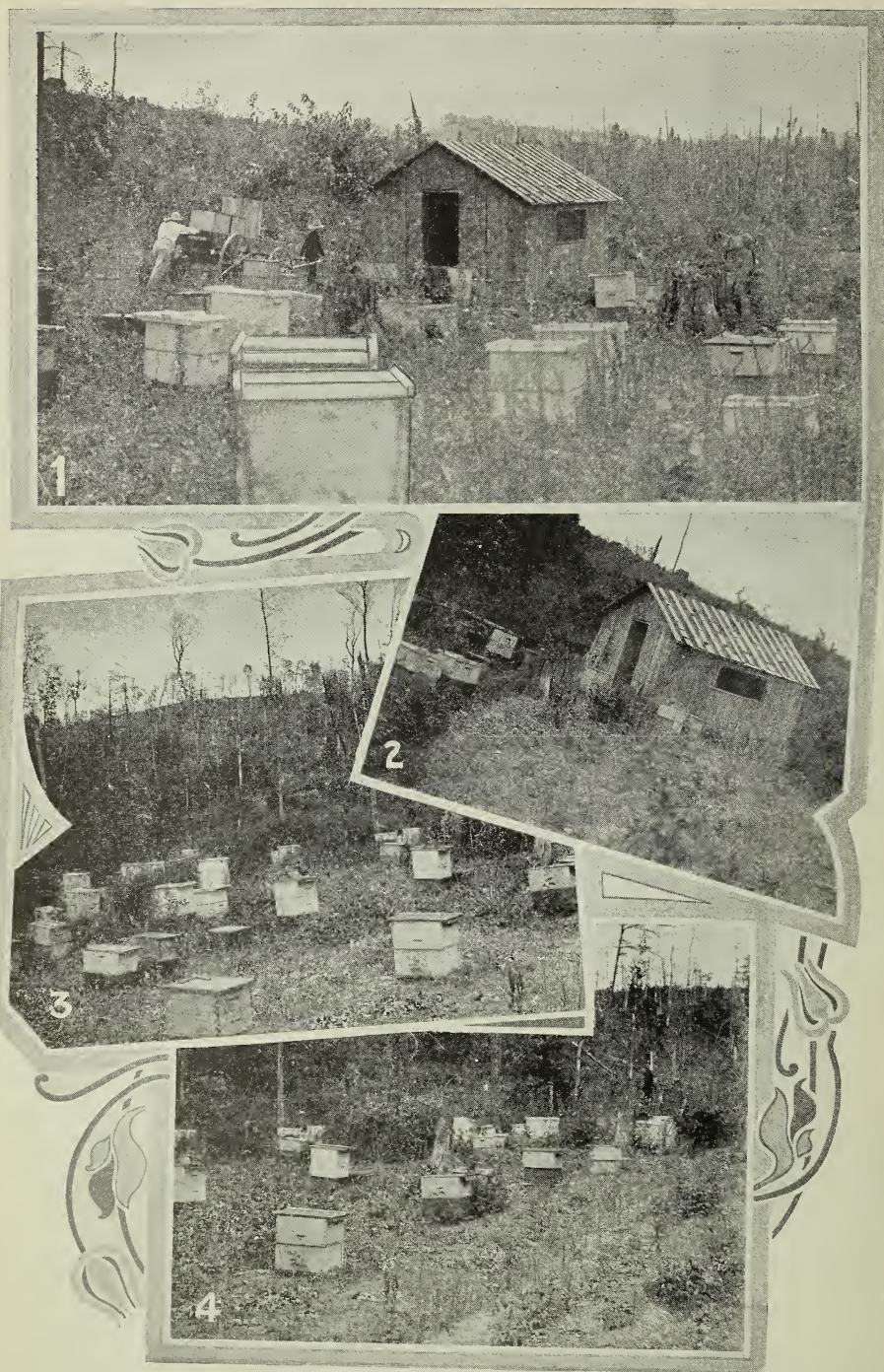


Fig. 9.—Bee-gloves with long sleeves to protect the wrists and arms.



E. D. TOWNSEND'S SPRINGBROOK APIARY, SHOWING EXTRACTING-HOUSE BUILT LIKE LUMBERMAN'S SHACK.

which is attached an upper part of netting that is faced in front with a square of black wire gauze. The simplest way to make this suit is to buy a cotton night-shirt two or three sizes larger than is usually worn; cut off a part above the shoulders, and another below the waist. From the remnants make extensions for the sleeves, long enough to come down over the knuckles, and cut a hole in the side for the thumb. The lower part of the blouse is taken up with a string gathered in the edges. It is drawn tight, and tied.

The visor in front of the face is made of black wire netting. Since the larger the mesh the easier it is to see, the writer uses a piece about eight inches square, with a mesh of eight wires to the inch. To prevent the wire cutting the netting it is edged with a strip of inch-wide oil-cloth doubled all round and sown slowly on the sewing-machine.

White netting, such as is used for window curtains, is the best material to use for the upper part of the suit, as it permits of a free circulation of air. It should be quite loose in the back, but not so in front, for the closer it is to the face the better one sees. The upper part of the square of wire netting should reach the brim of the hat; if it does not, the sun's rays will strike the white curtain and irritate the eyes. It is better to sew the wire gauze in place before the white netting in front of it is cut away. The upper part of the white netting has a piece of elastic hemmed in to permit of the veil being speedily adjusted to the hat or freed from it.

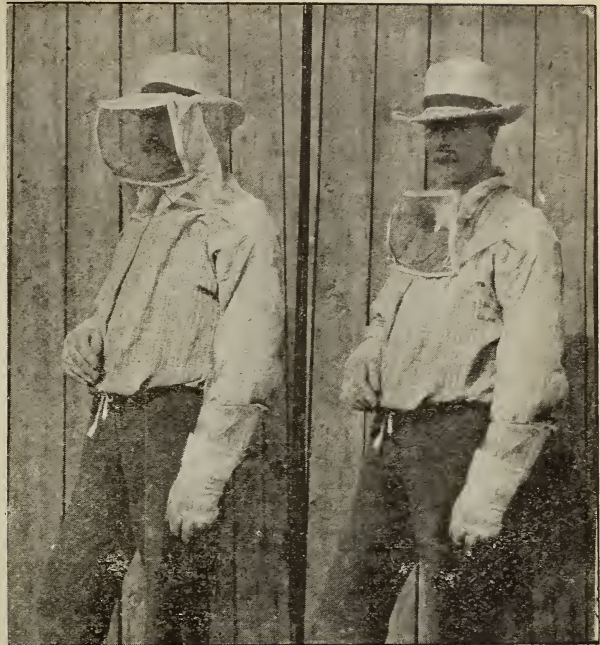
The pieces that protect the hands are made sting-proof by being coated with paraffine. This is easily applied by means of a dessert-spoon while the melted paraffine is hot, running it where it is wanted, and spreading with the spoon.

Fig. 7 shows the veil in use; Fig. 8 how it can be lowered from the face for any purpose, such as mopping the brow, wiping spectacles, or to get a drink of water.

GLOVES.

When the simple veil is used it is better if the gloves have long sleeves, as shown in Fig. 9. If the stings reach through the cloth the gloves can be made absolutely sting-proof by applying a coating of linseed oil. This is best put on with a brush, taking care to use the least possible quantity.

With the Coggsall bee-suit, long sleeves to the gloves are unnecessary. A good glove for this outfit is one made of sheepskin, which, the writer has been told, is



Figs. 7 and 8.—Showing the Coggsall veil and suit.

much used by the cowboys of the western plains. It is very thin, with a glossy surface which turns a bee-sting effectively. Such a glove can be slipped on when the occasion demands protection, and is as easily taken off.

The lower openings of the trowsers legs must be closed, either by the application of bicycle-clips, pieces of string, or by tucking them into the socks. High shoes are preferable to low. Ladies should wear a divided skirt fitting tightly to the ankles, or some kind of trousers under an ordinary short dress.

The writer has found the Coggsall suit to be perfectly bee-proof, and as handy to don and doff as an ordinary veil. When he is foolish enough to wear sleeveless undershirts, once in a while the bees of an ill-tempered hive will attack his left forearm and inflict a dozen or two of pricks that annoy for the moment, but the pain is gone in less than a minute.

Victoria, B. C.

BEE-KEEPING FOR BEGINNERS, ILLUSTRATED.

The Arrangement of the Apiary.

BY E. D. TOWNSEND.

A glance at the engravings will show the reader that our Charlevoix Co. yards are back in the woods, away from planing-mills or such conveniences. Under these circumstances we built the honey-house shown in Fig. 2 on the plan learned of the wood chop-

pers of this locality. After all the timber is taken off that is good for logs, etc., the remaining portion is cut into wood for different purposes. A "gang" of perhaps half a dozen families will put up shacks in a certain location where there is wood to chop, and then, after cutting what timber there is near, these shacks are taken down and moved. The material is rough lumber direct from the mill, and the frame and all is put up with as little nailing as possible, so that it may be easily taken down and moved. At the destination, each part being intended for a certain place, all goes together about right. Of course, some boards are spoiled in taking the building down and moving, and these have to be replaced. Tar paper does the rest—that is, it keeps out the cold and wet. In case of our building as shown, it keeps out robber-bees as well as the rain. We want the building cold to kill the moths during the winter, but, of course, we pay no particular attention to this feature.

Figs. 3 and 4 show that the location is protected, and they also give an idea of the wild nature of the surroundings. This particular yard is called Springbrook, so named on account of the beautiful spring about twenty rods up in the woods, from which a brook runs down to the very edge of the apiary, providing water of the finest kind for either man or bees.

The apiary proper is located on a parcel of level ground between two hills, with additional protection from undergrowth on nearly all sides. The foliage seen at the left of Fig. 3 is the wild red raspberry, and on beyond is the pasture from which most of the surplus honey comes.

Some of the colonies in this yard are a part of a carload bought and shipped in, and they are not yet in ten-frame hives, but they will be transferred next spring, as the frames are all of standard size.

In Fig. 1 the "push" behind the wagon is the writer, and it is a good picture of him too. His oldest son, Delbert, between the hills, has almost entire charge of the 260 colonies in this county. It usually happens that the ground slopes either toward or from the yard, so that a light load can be drawn by hand one way or the other. In this case the slope is from the yard, and so the load is pushed down to where the horse is tied. The horse, as shown, is hardly a safe distance from the bees, but it was hitched at this point while the picture was taken. At the last minute, when every thing is in readiness for the start, the wagon is drawn by hand near the horse, as I mentioned before, which is then hitched on and driven out of range of the bees.

If a load is to be drawn toward the yard during a part of the day when the bees are flying, so that it would not be safe to drive clear up to the honey-house, the horse draws the wagon as near as is safe, and then is quickly unhitched and taken a distance away and hitched; then the load is taken the rest of the way on a wheelbarrow.

Remus, Mich.

SWARMING PREVENTED BY PROPER CARE INSTEAD OF BREEDING.

BY J. E. CHAMBERS.

Although I am a firm believer in Carniolans, and have now nearly 800 colonies, I do not have over 6 per cent swarming. For some years past, the swarming habit has been slowly decreasing—I think in exact ratio to my better understanding of bee nature. Another factor, I think, is the use of large hives at all seasons of the year, with a good supply of honey and drawn combs. I think generous ventilation and shade also have something to do with the non-swarming of these bees—the so-called greatest swarmers on earth. But perhaps the most important reason why I have so little swarming is that I try to get every colony well started to gathering honey before the condition of the hive becomes crowded with young bees. With this object in view I winter all colonies with from 75 to 100 pounds of honey in the combs; and as soon as extensive brood-rearing is begun I extract clean—that is, if there is a flow on, or near at hand. This gives abundant room at the right time. Some foundation can also be provided, and fine combs for cutting can be secured. As is doubtless known, I produce bulk comb honey only.

For ten years I have been laboring to perfect a method of swarm control, and I think I have it at last; but I have awakened to find that the colonies that swarm do not pay me for the time that I lose in manipulating to prevent the swarms; yet there are some seasons when bees get only enough honey and pollen to rush brood-rearing, but not enough to store much; and it is then that swarming is a real problem, and I like to know that I am master of the situation.

CARNIOLANS AHEAD OF ITALIANS.

The late D. M. Edwards told me that only Italians were valuable for honey production in this section of the Southwest, and that Carniolans reared too much brood and swarmed too much. He also told me that I would have to amend my practice in regard to the use of excluders, and that no marketable honey could be produced except by their use. However, in spite of all this, and in spite of the fact, too, that my bees were shipped by rail over four hundred miles, and hauled by wagon seventy more, coming through in damaged condition, and that less than 400 colonies were in the field, I secured 34,000 pounds of comb honey, and it was marketable, as evidenced by the fact that I sold it in the local market and at top prices.

During the past year, when bees of all kinds were in a state of starvation, dying and deserting their hives in a wholesale manner, I again proved the vigor of the Carniolans and the ability of this race to stand up against adverse conditions when all others diminished or died outright. I secured \$3000 worth of honey and made 20 per cent in-

crease, and my apiaries are to-day in better condition than I ever had them before.

SHADE AND EXCLUDERS.

I certainly believe in shade, and just as certainly do I not believe in excluders. In this climate one would be blind if he could not see how bees suffer without shade, so that great numbers are engaged in carrying water on hot days. The water-carriers are reduced in number when shade is furnished.

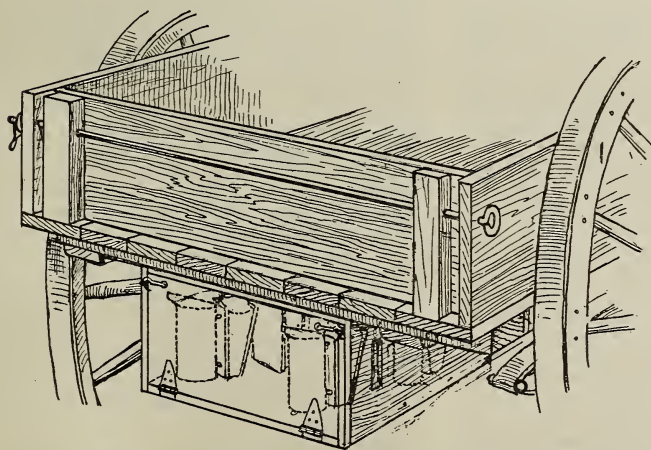
I can not comprehend how any one should wish to use an excluder that enforces such discomfort on the poor bees. I agree with Mr. Scholl that it is a honey-excluder as well as a queen and drone excluder. I may not be as scientific as some, but I should hate to see the day come when I would be compelled to use excluders, as I should certainly regard them as a handicap of the most unpleasant kind.

Uvalde, Texas.

A BOX FOR CARRYING SMOKERS.

BY WESLEY FOSTER.

In going from one apiary to another in our rounds it is very convenient to have a lighted smoker on hand so there need be but one lighting of smokers during the day. It is not safe to carry the lighted smokers close to any material that might be easily ignited, as the fire always gets to burning briskly before the yard is reached, owing to the draft caused by the moving wagon. Then the smoke is disagreeable to have continually blowing into one's eyes. We fixed



a box with a hinged door fastened by means of bolts to the under side of the wagon-box at the rear end. The box will hold four Jumbo Root smokers standing upright, and is made out of a wooden case that holds two sixty-pound cans. The box might be lined with tin, though we have found this unnecessary so far. The sides are bound with strap iron to add to the strength, as the jolting of the wagon would soon shake every thing to

pieces if the corners were not bound securely.

Boulder, Col.

HOW TO KEEP BEES FREE FROM EUROPEAN FOUL BROOD.

BY D. E. ROBERTS.

Our problem is not how to cure this disease, but how to make our bees stay cured. One step toward a permanent cure would be to transfer the bees in box hives into the "bonnet" of the owner. The constant contamination from the old box-hive colonies is what makes trouble.

Another thing that all of us can do who have bees on movable frames is to keep all colonies at all times as strong as possible. This is difficult, under the circumstances, we know; but colonies which we think are well over the disease toward fall can be fed abundantly, and thus be carried over the sluggish period to a time when we can do something with them.

"Strong colonies" is a term often used, but I have never read an explicit definition of it. At present I take it that a colony is either strong or weak according to the work it has to perform. Last summer I formed ten nuclei. As a matter of experiment a queen-cell was grafted on a comb that was not above suspicion—in other words, a comb that contained disease. This comb with its adhering bees, in addition to those of two other brood-combs, was placed between two solid frames of honey. This was done with all ten; and afterward eight of the nuclei showed no sign of disease. I suppose this would substantiate Dr. Miller's theory, page 753, Dec. 1, 1910. (By the way, I am glad the doctor has the disease among his bees; and, although I hate to say it, I hope he will not run short of material until he is through experimenting.) But these ten nuclei, I think, show what a few young bees with a young queen will do if put to work in the right manner.

All of the so-called cures of European foul brood seem to have one point in common—that is, the arrest of brood-rearing. Apparently, nature also works this way. I have had colonies that became healthy without any help; and the conditions when this occurred were about as follows: All colonies at the time were not overwhelmed by the disease, but had perhaps over half of the brood capped. The honey-flow was abundant, and the queens were in condition to allow themselves to

be restricted in their egg-laying. The honey, consequently, took the place of the dead larvæ, instead of more eggs, and the brood became more compact and finally healthy.

I came to the conclusion long ago that any number of old bees with an old queen does not constitute a *strong* colony. Young bees with a young queen abundantly supplied with stores in the fall, and well protected during the winter, are the prime factors in the control of this disease.

Knox, Ind.

FURTHER PARTICULARS IN REGARD TO THE LONG-IDEA HIVE.

BY GEO. SHIBER.

Having received a number of inquiries in regard to my article, page 421, July 1, 1910, about the Long-Idea hive, I wish to give a little more information in regard to it as used in my locality.

A subscriber in Cuba wants to know how I manage when I have swarms, adding that such hives would be too heavy to lug around. Yes, they are too heavy to carry around very much; but I never have had to move any of them on this account, for I do not remember ever having a swarm issue from any of them. Most of the hives contain 32 to 34 frames, and this size is nearly swarm-proof in New York State. From what I have read of conditions in Cuba, I should expect more or less swarming, even with the Long-Idea hive.

The entrance of these hives is in the same place as usual—that is, in the middle of the hive at right angles to the frames. In the illustration, page 764, Dec. 1, 1910, the entrance is in the broad side, facing the front. I never tried an entrance in the end with the side pointing toward me in the picture, but I do not believe I should like it.

Another subscriber, Mr. F. McCann, La Gloria, Cuba, wishes to know if it would not be a good idea to have an entrance in both ends—that is, at the end where I am sitting in the picture referred to above, and also in the opposite end. If I lived in Jamaica or Cuba I think I would try it, provided the entrance in the long side at right angles to the frames, as we use it, did not reduce swarming; but, as I said before, I am not bothered very much with swarming. The only objection I can think of with the two entrances is that I should think the queen would scatter the brood too much. Mr. McCann, in his letter, said he had built a few Long-Idea hives having the double-entrance feature. I should be much interested to read his report after he has tried them.

I have never tried a cover made in sections. Mine are nearly all of $\frac{3}{8}$ hemlock boards, cleated at each end, and covered with waterproof paper. If I could get galvanized iron at 4 cts. a square foot in Cuba I would use that material; but why would

it be necessary to have this over a cleated wooden cover? Why would not galvanized iron do alone to keep out the rain? Plenty of quilts could be supplied over the frames. Right here I should mention that a number have thought a bee-space necessary over the top-bars in this hive; but please bear in mind that I do not tier up stories. The illustration referred to shows that there is quite a little space between the top of the frames and the top of the hive—about two inches, in fact, which is plenty of room for quilt and packing. The space between the bottom-bars and the frames and the floor is about one inch.

I do not have all of my bees in this style of hive, as most of them are in eight and ten frame hives. I have had only about 15 or 20 in the Long-Idea hives for a few years back. During the harvest the Long-Idea hives are all right; and to my northern friends who are interested I wish to add a word of caution against building a lot of them, as it is very difficult to winter colonies in them successfully. I have tried wintering them outdoors, leaving about ten or twelve frames in the middle of the hive, and packing at each end and on top of the frames. I took special pains to pack about a dozen in this way in the fall of 1909, but the result in the spring of 1910 was disappointing, for the colonies, though they came through alive, were weak, and only about five were really first-class. I have never succeeded in wintering out of doors with these hives. I wish I could report otherwise, for I hoped I could use the hives at outyards and save the trouble of putting them in the cellar; but now I lift the frames with the bees into regular bodies and carry them in the cellar; and in the spring, when they need more room, the Long-Idea hives are filled up.

This winter I have no bees in these hives out of doors, all of them being in the cellar. Perhaps in Connecticut the winters might be milder; and to any one in that State, so inclined, I would by all means recommend a trial, but on a small scale at first. My cellar has given such excellent results in the past that I can hardly expect to find a more profitable way of wintering, as the temperature is almost constant at about 42 to 43 degrees Fahr. If the outside temperature drops to eight or ten degrees below zero I usually find the cellar temperature about 41 degrees. I have never tried this hive for comb honey, but I do not think it would answer at all.

Randolph, N. Y.

Idaho as a Bee State.

To those bee-keepers of the East and Middle West referred to by Mr. Wesley Foster under "Bee-keeping and Homesteading," page 750, Dec. 1, 1910, I wish to say, if you do not find what you are looking for in Colorado come over the Hill to the Gem State. There is yet homestead land to be had near good bee-pasture. I am not a shark or a real-estate agent—just a plain bee-keeper, but will gladly furnish information to any one interested.

Caldwell, Idaho, Dec. 26.

J. E. MILLER.

Heads of Grain

from Different Fields

Getting Rid of Dark Honey in Bait Sections.

When putting my colonies into the cellar for winter I removed the supers, intending to put them back on in spring. On examination I found the sections partly filled with very dark honey, which, if put on, would spoil the first crop of sections next summer. Would these be fit to use again if left to the bees in spring to be emptied and stored in the brood-chamber, which would insure plenty of food? Any information will be esteemed a favor.

NOVICE.

[This question was referred to Dr. C. C. Miller, who replies.]

It would be a nice thing if you could put on the super in the spring, and count on the bees to empty out all the dark honey before filling the sections again. But they will hardly do that unless the brood-chamber be emptier of stores than is advisable. They seem to think that the super is the proper place for some extra honey, and will be slow about cleaning it out unless hard driven for stores.

If you set the supers out in the open, the bees will rob out the honey; but they will also tear the sections—that is, the comb—to pieces. To avoid that, you must cover up the supers and allow an entrance for only one bee at a time. If there are many supers in the pile, allow such an entrance for every three or four supers. Your neighbors' bees, however, may get the lion's share. If there is danger of that, start the bees at work in the evening. Put one or more sections at the entrance of one or more hives, and, when covered with bees, remove to the pile. That ought to start the work. Then after flying has ceased in the evening, or before it starts next morning, remove the supers or close up tight, and expose again next evening, just before flying stops. Or you may extract most of the honey, leaving the bees to do the final cleaning. A special holder may be made to hold the sections in the extractor; or you may get along with merely a frame two inches wide to hold the sections. But you must handle them carefully so they will not tumble out. In any case, there is danger that some of the honey is candied, and it is possible that the best thing may be to melt the sections, lifting off the cake of wax when cold. Next time be sure to get such sections cleaned out in the fall, before the honey candies.

C. C. MILLER.

Rearing Good Queens in March in Texas ; Making Increase for an April Flow.

I intend to rear a few queens in March, but I do not know whether I can rear good ones so early; therefore I have decided to ask you a few questions:

1. On Jan. 28 my bees began to gather pollen. Do you think I can rear good queens in March by putting one story of sealed brood on a strong colony, and, ten days later, removing the queen and giving them a comb with young larvae from my best queen, as Dr. Miller describes in his "Forty Years Among the Bees," and trim the comb as he does? In addition to this I wish to feed them half a pint of thin syrup every night.

2. If I begin to feed my bees now, will it be possible to make two colonies from one by the Alexander plan and have them strong enough for the first honey-flow, which comes in April?

Brenham, Texas.

J. R. KUBITZA.

[This was referred to Dr. Miller, who replies.]

1. You ought to be able to rear fine queens in that way, but likely you have set the date rather early. No amount of feeding can get you in much ahead of the usual time when bees prepare queen-cells for swarming. Likely you will find the most difficult part the getting of the right kind of a comb from your best queen. If you take an old comb you will probably get but few cells started on it—possibly none, for the bees will be just as likely to start cells on any other comb, as described in my "Forty Years," there will be no cells worth minding anywhere except on that one comb. So you must try to get that comb started some time in advance. If

you have your best queen in a strong colony, and give an empty frame with mere starters, you will, as likely as not, have the frame filled with drone comb. You can avoid that, of course, by giving a frame filled with worker foundation; but you will have better results by taking away most of the combs from your best colony. If they have only three or four frames of brood, and an empty frame be put in the midst, you may count on the prompt building of just the kind of comb you want. If the bees are getting natural stores, the feeding you mention will not make any difference.

2. The probability is that you will find the plan for early increase a dead failure with you. It is easy, however, for you to make a trial of it with one or two colonies, and then you will know better than any one could tell you.

C. C. MILLER.

Feeding Molasses and Sugar in North Carolina.

To prevent bees from robbing each other when being fed is a serious matter. I have some colonies that must be fed not later than February 15, and possibly before then, and I dread it, because of sudden changes in temperature. After a few warm days there may be cold north winds; and if there is no honey-flow it is necessary to keep up feeding after it is once begun. Would it be safe to feed sugar-cane syrup or molasses, diluted with sugar (granulated) and water to be equal in density to 3 parts sugar and 2 water? Would it be less exciting to the bees?

How many pounds of sugar would be required to make, say, twenty pounds of sealed stores, such as bees need for winter food?

Ronda, N. C.

J. R. BRYANT.

[If you have much trouble from robbers while feeding, feed toward night or after the bees have stopped flying; and do not give any more feed than the bees can take up in one night. For your purpose we would use a Doolittle division-board feeder, or a bread-pan and cheese-cloth, placed in a super or upper story above the frames. In any event we would not use an entrance feeder; and it is better not to use even an Alexander feeder, because the odor of the syrup so near the outside of the hive would have a tendency to attract robbers.]

We have had no experience in feeding a combination of molasses and a syrup made of granulated sugar and water. If your bees can fly during the time they are fed we would use the cheaper feed or molasses; for we assume that a syrup made of granulated sugar would be more expensive than the unrefined molasses direct from the sugar-cane. If, however, you wish to make a mixture of the two, we would prepare the granulated-sugar syrup so that its body or consistency would be the same as that of molasses—that is, mix the sugar and water, two parts of sugar to one of water; then stir the two syrups together.

As to how many pounds of granulated sugar it would take to make 20 lbs. of sealed stores, this depends. A good deal would depend on how thick the syrup was when it was fed. A syrup of two parts sugar to one of water, when fed to the bees and capped over in the combs, has shown a loss of about ten per cent. In other words, for about every 10 lbs. of two-to-one syrup fed, you might expect about 9 lbs. of sealed stores; or, again, 6½ lbs. of granulated sugar would make about 9 lbs. of stores when sealed. If you fed a syrup of equal parts of water and sugar the loss due to the expulsion of water would be much greater of course—just how much we can not say.—Ed.]

The Proper Paint for Hives.

Several articles have appeared relative to painting hives; and as I have had twenty-two years of experience, sixteen of which was house and ship painting, I will offer a few suggestions.

To get the best results when no color is used, mix carefully 80 lbs. of pure white lead and 20 lbs. of the best American zinc. Put the Japan (not patent drier) in with the lead and zinc, and mix all together with a small portion of oil to make a stiff batter. The zinc is lighter than the lead, and it will require considerable mixing to have the materials blend well. For this amount of material, use one quart of good Japan, and thin with pure raw linseed oil, using about four gallons to the hundred. Boiled oil should not be used, as manganese is used to form the drier, and this is destructive to the pigment. If the painting is done close to salt water, a

little more zinc, say about five pounds, can be added safely; but if too much zinc is used it will cause cracking. I have used this mixture for many years for vessel work and for seashore-cottage painting with good success.

The life of linseed oil when mixed with pure white lead is about four years. When zinc is added it increases the wearing qualities of the oil from two to three years. It is better not to apply the paint in one heavy coat, as two coats are preferable, sufficient time being allowed between for the paint to harden. It is a bad plan to use pure lead for a paint where cattle can get to it, as pure lead chalks off, and the cattle lick it so much that they get the colic. I should think this might prove detrimental to bees also, as the fine particles wash off with the rain; and should bees partake of the water it might poison them.

Philadelphia, Pa.

J. T. MORIARTY.

Deaths from Stings Rare.

Please note the attached clipping, which may be of interest to you. However, I am skeptical as to the poison causing the woman's death. I am more inclined to think that the aged woman had a bad heart, and that the over-exertion in trying to escape from the bees caused her death, and not the poison. Here is the clipping:

Mrs. Christian Knouse, of Mt. Pleasant Mills, Snyder Co., died from blood poisoning caused by bee-stings a few months ago. The deceased was over 60 years of age. In the home-land she and her husband kept bees. Two months ago, while working with a swarm, both of them were severely stung. Mr. Knouse recovered from the poison of the bees, but Mrs. K. took to her bed and never recovered. Blood poisoning from the stings is believed to have been the direct cause of her death.

Have you ever known of a death caused by bee-stings?

Huntingdon, Pa., Jan. 14. S. A. HAMILTON.
[We have known of cases where persons have died from the effects of a severe stinging. Death, however, always followed within a comparatively few hours. In all such cases the developments have shown that the persons who have died have had very weak hearts. Cases of fatalities from bee-stings are very rare indeed. We can not recall more than half a dozen in all our experience of over 25 years with this journal, where persons have died from the effects of one or more bee-stings.

This particular case, however, is a little peculiar. We should naturally think that a case of blood poisoning would be of more rapid development than that indicated in the clipping. It seems that death did not take place until two months after the woman was stung. While it is presumable that the bees were the indirect cause, the probabilities are that any other shock or injury would have caused death in much the same way. The poison of the bee-sting is antiseptic, or at least said to be so by some scientific men. It is altogether improbable that a case of blood poisoning could have developed from these stings.—ED.]

Settling-tanks Used Five Years with Good Results.

I have used settling-tanks some five years, and they have proved satisfactory. As I am a poor man, and thought those steel tanks too expensive, I simply got a few sweet and clean whisky-barrels, standing them on end high enough from the floor to allow a 50-lb. can on small scales to take honey from the faucet near the lower head of the barrel. Of course, the upper head of the barrel was removed. I see no need of a float. I simply dump the honey from the extractor into the barrel. All cappings and bits of comb will take care of themselves, and remain right on top of the honey, where they should be.

GASOLINE VS. ELECTRICITY VS. "ELBOW GREASE."

What a difference there is among bee-keepers regarding the various ways of extracting honey! Mr. Townsend, I think, believes "elbow grease" the best way to turn the crank. Say! let it be the boys who turn the crank. E. D. would rather shove the quill at so much per page. Now up jumps Mr. Shepard, p. 42, Jan. 15, and says his little ½-H. P. motor beats elbow grease "all hollow." Then up jumps old man Smith who says that, with his "goes like sixty" gasoline-engine and eight-frame automatic he can beat Shepard "all hollow" with his electric motor, while E. D. would be so far in the rear he would appear like a fly-speck.

Birmingham, Mich.

A. W. SMITH.

Putting Crates of Sections in the Cellar Before Folding, to Prevent Breakage.

I was just looking over your latest A B C and X Y Z of Bee Culture, at "Comb Honey," page 104, where you speak of the T super not squaring the sections that are inclined to be diamond-shaped, as I very often find they are with a great many comb-honey producers in a small way. But if the sections are made properly I find no such trouble. Generally speaking, it is caused by pouring water, sometimes hot, in the V grooves, to prevent breaking. This plan is certainly a mistake, as the wood takes in too much water, and swells up the end grain and spoils an otherwise perfect section. I never use any water. I just put the box of sections I wish to fold in a cellar a day or two; or if it is a rainy day I place them in an open shed for a few hours, where the air is good and moist, and the job is done to perfection, so that there are no sections that are not square. If I had known the trick at first I am sure it would have saved me lots of trouble.

Arkona, Ont.

I. LANGSTROTH.

Difficulty in Drowning Bees.

Suppose the pores in a bee's body become clogged, what happens?

Middleton, Ida.

A. S. BIXBY.

[If the spiracles in the body of the bee become clogged with honey the bee suffocates. Even if the head of the bee should be perfectly dry, suffocation will take place after a time just the same, unless the honey is cleaned off. Of course, there is considerable oxygen inside the body of the bee in the complicated breathing system. You might be interested in knowing that, even though you drown bees, apparently—that is, keep them under water for hours until they seem to be perfectly lifeless—yet under favorable conditions they will revive and be all right again. On one occasion when we were arranging to photograph a queen we kept her under water for hours, then dried her carefully and arranged her just as we wanted her, on a white cardboard, with her legs, wings, etc., in natural position. Just as we were about to take the picture, however, her legs began twitching, and in a short time she crawled off the cardboard, apparently no worse for her experience.—ED.]

Writers should Tell their Main Sources of Honey and the Times of Bloom, for the Benefit of Those in Other Localities.

If writers for GLEANINGS would give the kind of flowers their surplus is gathered from, and the usual time the flow commences and ceases, it would be of great value to readers in other localities, for then they could at once see whether the methods described would be suitable for their own localities. Some very bad mistakes have been made by readers not first consulting a map to see what part of the State or country the writer lives in, so he can judge about the time of the honey-flow, the kind of flowers gathered from, etc. In our own State of Ohio there is the northern part with clover and some basswood; the central part with the clover alone, and the southern part with clover and a fall flow as well.

Mechanicsburg, Ohio.

C. E. LEAVITT.

Good Locations in California Scarce.

I believe the editor's advice in regard to bee-keepers going to California to locate is well taken. I know of no place where a location could be secured unless some one else were bought out; and an outsider has no way of telling whether he is getting a good location or not, for it takes an expert to judge. Very few who have good locations wish to sell.

In some parts of the orange belt, blossoms do not seem to yield nectar; and in the alfalfa regions the hay is often cut before it blooms, so that the bees get no honey from it. I have traveled over Southern California a good deal, and I have a pretty fair idea in regard to the possibilities there. I have three apiaries in different places, and I have always gotten along pretty well; for if I miss a crop in one place I am likely to make it up in another. This year I had 9 tons of honey from 450 colonies.

Hemet, Cal.

J. A. ST. JOHN.

A Modification of the Heddon Plan of Transferring: Placing the Old Hive Above the New One for 21 Days Instead of at One Side.

Having to make several transferrings I consulted my books on bees, and adopted the Heddon plan; but even with this I met many difficulties, and at last invented a new plan, or, rather, an improvement on the Heddon. I work on the Heddon plan until the queen has passed to the modern hive; and to be sure of this I place an entrance-guard on the hive. As soon as the queen is safely in her new home I change the Heddon plan to mine in this wise:

Instead of placing the old hive two feet away I place it *on* the new hive with a queen-excluder between them; and as the old hives in this country are smaller than the new, I put it inside of empty modern hive-bodies tiered up until they are at a height where I am able to cover securely with the modern hive-cover.

I leave it so until the 21 days, when, in the evening, I place a Porter bee-escape board underneath the old hive and queen-excluder, and next morning all the bees will have gone below, leaving behind them the drones, and old crooked combs that can be taken care of later.

The principal advantages to be obtained from my plan are as follows:

1. It avoids the double work at the end of the 21 days.

2. It avoids robbing and the bee-moth in the old hive which naturally is weak, owing to the separation of the bees.

3. There is no need to worry over a fight, as they are practically all in one hive.

4. It does not matter how many bees pass to the new hive with the queen or whether she be the first or last to go.

5. If there is nectar coming in, all you have to do is to place a super after the transferring, and it is sure to be attended to.

6. If the Heddon plan is used during wet weather, my plan avoids the chilling of the brood owing to lack of bees in the old hive.

Trujillo Alto, P. R., Oct. 24.

V. A. TEXERA.

[Where you have plenty of empty hive-bodies, and no honey is being stored at the time, your plan of transferring is an improvement over the Heddon. But many times there is no surplus of extra brood-chambers; and in that case the bee-keeper would have to adopt the Heddon plan pure and simple. In any event, if there is a honey-flow on we would use the Heddon plan rather than your improvement. It is desirable, after all the brood has hatched out in the brood-nest, to have as little honey in the combs as possible. When this brood-nest is on a separate stand, and it has only bees that are hatching out from brood, there would be no additional honey stored in it.—ED.]

What Happens when Bees Boil Out over the Sides of a Hive that is being Manipulated in a House-apary.

Some time ago I wrote you for information in regard to house-aparies about which I had read in the A B C book. I received your reply, and thank you much for your kindness in answering so fully. I intend to build a small house-apary next season, and there is one thing I should like to ask about. As I intend to arrange the hives they will stand back from the wall 4 in. and up from the floor 4 in. to allow for ample winter protection—the bee-pass-age, of course, being covered. Now, in some manipulations, as, for instance, destroying queen-cells, a strong colony will sometimes "boil" over the side of the hive, regaining the inside by way of the entrance after the cover is on. Now, the question is, if this occurred in the house-apary would this quart (possibly) of bees leave the hive and the building by way of the inch openings you recommend, and regain the inside by way of the entrance, or, if left to themselves, cluster on the hive and perish?

TROUBLE WITH CAPPING-MELTERS.

On page 30, Jan. 15, you invite comment on capping-melters. Two years ago I purchased one, costing me with freight, duty, etc., added, about \$15.00. I used it a part of one season, and it is now for sale cheap. I found most of the objection that others have noted, and in addition one serious objection which I have not seen mentioned by any one else,

and that was, a great deal of the wax would be found in the form of loose globules, from the size of a pea down to almost invisible particles. This could be saved only by skimming and straining, and even then there would be a certain amount of loss, and that, as you are aware, of the very best kind of wax.

In regard to that question of W. M. Shields, p. 51, Jan. 15, I think that, although these colonies had a fair amount of bees when he took off the supers in September they must have been queenless since the swarming season, and, by two months later, dwindled away.

Wesley, Ont.

GEORGE WOOD.

[You ask in regard to the bees clustering outside of the hive in the house-apary during the various manipulations. This will do no harm provided the inside of the house-apary is dark and you have openings covered by bee-escapes in one or two places. If the room is dark, the bees will always go toward the light, and, when once outside, they will go to their own entrances.

We believe your trouble with the granular wax was due to the fact that you evidently did not wrap up the can into which the honey and wax flowed, thus confining the heat and keeping the wax liquid till the work was finished.—ED.]

Report of the South Dakota State Convention.

The South Dakota State Bee-keepers' Association held its annual meeting at Sioux Falls, Jan. 27th. The attendance was not large, but great interest and enthusiasm were shown. An instructive and entertaining paper on "The Bee-hive and its Occupants" was read by Miss Rhoda Carey, of Ellis. Mr. W. P. Southworth gave us a very helpful talk on the handling and marketing of honey. President Ginsback told how to manage bees so as to get a good crop of honey.

Secretary Syverud talked on the subject of foul brood.

General discussion followed each topic, and great interest was shown by all. The questions and answers were few thick and fast.

The report of the secretary showed the association to be in a prosperous condition. It was decided to hold a field meet early in July.

The time of the next regular annual meeting was not decided upon.

Officers elected were—R. A. Morgan, of Vermillion, President; Mr. C. Pabst, of Dell Rapids, Vice-president; L. A. Syverud, of Canton, Secretary and Treasurer.

Sioux Falls, S. D.

GEO. F. WEBSTER.

Swarming More Easily Prevented with the Long-Idea Hives.

In the article describing the Long-Idea hive, page 765, Dec. 1, 1910, Mr. Shiber pays quite a tribute to the relic of the past generation. He truthfully tells some of the virtues of this hive, even if his frames (L. size) were shaped wrong. He forgot to state one important fact, however, and so I will do it for him. The swarming in spring can be more easily controlled with the Long-Idea hive than with any kind of bees, regardless of their nationality; and Mr. Hand, of Ohio, has perfected the system for the Langstroth hive, which I have used in a much cruder way with the Long Idea, without a failure. Mr. Hand's system is, to my mind, one of the newest kinks in hive-manipulation to control swarming, and is worthy of a fair trial.

Del Rio, Texas, Dec. 16.

G. KORNRUM.

Bumble-bees Not Subdued by Smoke.

I read with interest Frank C. Pellett's article on page 802, Dec. 15, 1910. It reminded me of an experience that I had several years ago. I had kept bees for several years, and had become comparatively immune to the effects of their stings. I was curious to know if this immunity extended to bumble-bees, and also wished to see what effect smoke would have upon them. I did not have as much confidence in the smoke as Mr. Pellett had, so I put on my veil and gloves before beginning operations. I got my smoker to going well, and then tackled a nice healthy colony of bumble-bees. I discovered in a very short time that I could not subdue them with smoke; and stung? Well, rather. For several days I carried reminders that I was not immune to the effects of their stings.

McNabb, Ill.

E. O. GUNN.

Our Homes

By A. I. Root

His leaf also shall not wither.—PSALM 1:3.

Some friends from the North, who have been reading GLEANINGS for almost forty years, were looking over our premises, and among other things our neighbor (Mr. Rood) called their attention to our six mulberry-trees that are now *once more* loaded with fruit, some of it just getting ripe.* It is now about six weeks since we had any rain, and yet the mulberry-trees didn't seem to know there *was* any drouth, for they were covered with a most luxuriant foliage as well as fruit, and I called the attention of our visitors to the fact that the row of trees stood close by the tiling that takes the water from our incubator cellar; and, in fact, at one place a box has been placed, forming a little spring where the chickens come from one large yard to drink. The spring in the cellar has never failed, so far, and I said to our guests, "You see, friends, these trees are like the one spoken of in that beautiful Psalm, 'And he shall be like a tree planted by the rivers of water that bringeth forth his fruit in his season.'"

Now, I do not know that Mrs. Root has ever *before* furnished a text for my Home papers; but she did this time, although she did not know it. The text she furnished was her added remark to what I had just said, "His leaf also shall not wither." Somebody then added, "And whatsoever he doeth shall prosper." Mr. Rood was standing near me, and I caught a bright twinkle in his eye as I followed with the remark, "Dear friends, that last is a *wonderful* Bible promise; and can it indeed be *all true*?" Since that time I have been pondering a good deal on that first Psalm, and, in fact, I have read it many times over and over.

Our good pastor, Rev. J. E. Henderson, has been giving us some startling and wonderful sermons of late. In one of them he spoke of *formal* prayers, repeating the same thing over and over, for instance, and he said something like this: "Suppose you were to go to your grocer or to the drygoods store and repeat the same lingo over and over every day; what would he think of you? The Bible again and again enjoins us to ask for the things we need, and says to

us, 'Ask, and ye shall receive.'"
Last Sunday eve his subject was about starting in the work for the new week, and he most earnestly enjoined *praying* over our plans, undertakings, and projects. His text was Mark 1:35: "And in the morning, rising up a great while before day, he went out and departed into a solitary place and there prayed." Then he added, "How many of *you*, friends, are in the habit of following the Master so far as to get up before day and pray about the work and tasks (often disagreeable ones) that lie before you?" Then he followed with an astonishing list of illustrious men and women whose labors have benefited the world, who were very much in the habit of rising early, and pre-facing every undertaking with most earnest and heartfelt prayer.

His earnest sermon called to my mind an incident of my early Christian life. Those of our readers who have taken GLEANINGS for thirty or forty years will, perhaps, recall the story, and that, when I turned partly away from bees, and began studying the *Holy Scriptures*, I was something like the man whose "delight is in the law of the Lord, and in his law doth he meditate both day and night." Now please, friends, do not think I am boasting, for God knows I am only telling you this story just as I would try to help you about raising mulberries and chickens. You know how much I am still given to hobbies; and when I first began testing "the promises of God," is it any thing strange that I should become not only enthusiastic, but even what the world might consider reckless? In my enthusiasm I went into our county jail, read the Bible, and prayed with a poor soul who was on his way to the penitentiary; and when he was honestly converted, as I had faith to believe he was, I was permitted to take him out of jail and set him to work. I was a jeweler at that time; and when one of the clerks who slept in the store was sick or called away I asked my new-found friend to take his place and keep watch of the valuable goods. He assented, but rather soberly, I thought; but in the evening, after I had closed up and was getting ready to go home, he came up and stood by the show-case. Pretty soon he began drumming on the glass, and finally commenced something as follows:

"Mr. Root, do all these watches and things stay right here in this show-case over night?"

At that date safes were not so much in vogue as they are now, and I had little money to buy one, even if they were. After a little he commenced again:

"I suppose some of these watches are worth thirty or forty dollars, are they not?"

"Yes, Fred, more than that. You are not afraid of so much *responsibility*, are you?"

"Mr. Root, do you realize what you are doing? You have, in your wonderful kindness of heart, taken me out of the jail, and now you propose to put me, a hardened sin-

*These six mulberry-trees were little whips set out three years ago. Last April they were so loaded with fruit (large *luscious* fruit, let me tell you) that we and our neighbors could not use them all, and at one period they got dead ripe and fell on the ground until even the *chickens* had more than they could use; and this year there is a bigger crop than ever before, and they are commencing to ripen the last of February. It hardly seems a month ago that they were destitute of foliage; and I can hardly realize that it is possible they are not only now in *full leaf*, but full of fruit. I presume it is largely owing to our very mild January and February, at least so far.

ner and thief, in charge of all this valuable property. Just a few weeks ago I would have jumped at the chance to take every thing here and go off in the night where you could never find me."

Then he broke down and cried—cried as I have never before nor since seen a strong man cry; and, dear friends, I am crying now, so I can hardly see the letters on the typewriter, as memory brings back again that scene. After he had calmed down a little, I said:

"Fred, you are not afraid your old temptations will come back when you are here alone in the night time, are you?"

He replied through his tears, "No, Mr. Root, *no! God bless you, no.* I am only too glad of the chance to show you that I will give my last drop of blood to protect *you or yours;*" and he kept his promise until the day of his death.

Just a word right here. In our State of Ohio there are toward 2000 men and boys in our penitentiary, and just now the papers tell us many of them are going insane because some foolish (and, I dare say, selfish and greedy) legislation has cut off prison labor. How many are there among these men and boys who might be won over to Christ Jesus if some man or woman who "meditates both day and night" could go in loving kindness and present the matter to them as *as I did to poor Fred?*

Yes, people *were* astonished and surprised at the way my new project (as they were pleased to term it) was turning out, and, as a matter of course, *Satan* soon began to "sit up and take notice." It became noised abroad that a desperate fellow just out of jail had charge of my premises nights, and, furthermore, it was reported that I had said in prayer-meeting I was asking the Lord to help me pay my debts. I was just at this time putting up the first brick structure of what is now a mass of buildings on our grounds. The walls were up, but the roof was not yet on, and it was coming on winter. Although I had so far paid all bills as agreed, when everybody wanted their money *all at once*, I found myself in a very unpleasant predicament. I well remember one afternoon when I went up street and down to get a little loan from all who had been kind and ready before; but now all, seeming with almost one consent, turned against me. One good old farmer gave me a temporary loan when I told him the condition of things. Even Mrs. Root was worried, thinking maybe I had been too reckless. Yes, I was troubled too; but I remembered that part of the little hymn, "What a friend we have in Jesus!" which we sang so much in jail at just about that time; also "Take it to the Lord in prayer." Our property was already mortgaged to finish that new building, and my life was insured also for the benefit of a friend who had let us have money. We *did* "take it to the Lord in prayer," and, let me tell you, the *prayer* was no *half-hearted* repetition." I told God, just as Elijah did, what the trouble was, and

what we wanted; and he not only *heard* but *answered*. I wish you would all read the whole verse from which I have taken my text. And, while you are about it, read that whole short chapter. Is it extravagant in what it says about the man "whose leaf also shall not wither"? Listen. Before the money was due that I must have, a man came from Quebec, Canada, to see my inventions for bee culture, etc., and he was interested too in getting boys out of jail, and setting them to work; and before I had told him, or before he *knew a thing* about my cramped finances, he sent me \$500 in *gold*, and it reached me *the very day* that the money had to be raised. Was our good pastor extravagant in what he said about praying for *just what* we needed to do the work that lay before us? and about the man who makes it the practice of his daily life to meditate on God's holy law "both day and night"? does it not seem true that "whatsoever he doeth shall prosper"?

Poultry Department

By A. I. Root

MY "PROGRESSIVE" CHICKEN-RANCH
DOWN IN THE FLORIDA SUNSHINE.

I have for some time past had visions of a row of yards, small at first, but gradually growing larger as the chicks grow, where the little chaps can be moved along, or "promoted," as fast as they get bigger, and for the first time in my life it (the daydream) is pretty well realized while I write. The row of yards is right along the street, and the first one where the chicks are taken when first out of the incubator is perhaps only two or three rods square; but the ground is sown with oats so as to have them just coming up when the chicks are first put in. We carry them to their yard in the basket brooder I have described, and during warm sunny weather, such as we have had almost all of January, their only covering is the feather dusters I have described, except a light piece of cloth thrown over the basket at night when I carry them to the incubator cellar while very young. This feather-duster brooder right by the street causes quite a little attention and remark. For instance, some ladies called one evening to look at my "wonderful improvements," etc., and finally one of them asked if it was true I *hatched eggs* placed under feather dusters, just by the heat of the sun.

"Why, the boys *declared* it was so; they said they saw the whole apparatus going every day as they passed along the road."

Come to think of it, I am not so sure this will not some time be done. All we want is some sort of storage battery that will accumulate heat during the day and give it out during the night. Well, the first shelter is the basket-brooder—a piece of enameled cloth being provided in case rain should come up, and to put over them nights when

they are, say, a week old and can be left out all night. Of course our yards are closely fenced with inch netting that goes well down into the ground to protect the very young chicks. The next yard to which they are moved when about three weeks old is larger, and has a more substantial brooder, or brooders with more room. Much ventilation is required here, and so all the small house brooders and houses have more or less inch netting in their construction. We now have five yards in our "progressive" series, the largest being about four rods square. The brooder houses keep getting larger until the last one is almost big enough for the attendant to stand up inside. We have a 70-egg Cyphers incubator, so each yard contains, say, from 40 to 60 chicks; and when a new hatch comes off, we just "promote" each family to the next house and next yard. As they are all shut in at night we just pick up the brooder or little house and carry it through the gate into the next yard. So far our work this winter has been remarkably successful. We have scarcely lost a chick; no vermin of any sort, big or little, since the possum we caught, mentioned in the Feb. 15th issue, 1910, and we have yet to find a single insect on grown fowl or chick. Very likely the "heroic" measures my brother took last summer, not only to rid but to keep away all vermin, has had much to do with it.

Besides my incubator-hatched chicks we had had more or less hens sitting all the time. In order to prevent jangles about ownership of the chicks we have not more than one hen with chicks in each of the large yards where the laying hens are. Now we keep in stock three sizes of poultry-netting—one-inch, two-inch, and three-inch mesh, all two feet wide. All outside fences are, for the lower two feet, one-inch mesh; all inside yards for small chicks are also inch mesh; while the inside yard for laying hens and all adult fowls is two-inch. The three inch is used only for the upper part of the inside fences and sometimes for the lower part also, where we wish to admit the good-sized chicks into the growing oats. Bear in mind what I have told you about the "green pastures" we keep all around the ranch by sowing oats and other green stuff in the ten-foot-wide lanes.

Well, while the mothers of the chicks can not get into these green lanes and tear things up, the chicks have access at all times*; and I know of no prettier sight than to see a brood of happy chickens pasturing on the oats in these green lanes, and I do not know of any thing that makes chicks grow as do oats about two inches high.

MY INDIAN-RUNNER-DUCK STORY.

Just as I started on my summer trip to

Florida on the 20th of July last, a setting of duck's eggs was just hatching. I think we got about an even dozen from the 15 eggs; but before I got back (in 25 days) all were dead but four. Mrs. Root did every thing all right so far as we could discover, allowing them to run with the other poultry; but after I gave them a yard by themselves no more died. We had them expressed down here, and they proved to be two ducks and two drakes, and one of the ducks began to lay about the first of the year, when she was a little over five months old. The other commenced a little later, and both have given us an egg every night with more regularity than any Leghorn or any other breed of hens I ever owned. Well, the back side of our five acres is bounded by a running brook that empties into the bay, so we have a fine place for ducks; but I failed to induce them to go into the water until an accident happened. The books and journals tell us a two-foot fence will hold ducks. It seemed to hold ours until just about the time the first one began to lay. As they were getting old enough about that time to amuse themselves by chasing my buttercup hens, we fenced them off near the creek with the two-foot netting; but one morning the laying duck was out and at her old pastime. When we tried to drive her back she seemed to have gotten wind of the women's-suffrage movement (or was she minded to have a "honeymoon" all by herself?) for she sprang up into the air and not only scaled the two-foot fence, but went almost as high as the tops of the pine-trees. Isn't it funny that ducks and chickens, having all the finished mechanism for aviation, seldom or never use it, while *man*, after ages of vain endeavor, has only just "got off the ground"? Here I have been, leaving my valuable ducks all this time away "up in the air." Well, when she came down, ducklike she alighted in the water, the first time in her life to get into water deep enough to swim in. I was in a quandary. Her antics in the water surpassed any thing I have ever witnessed in the way of trained animals; and yet when a boy I was an enthusiast in witnessing the feats in the animal shows. Was she going to turn wild duck, and fly away and never come back? I glanced at her three companions, and they were evidently *wild* to follow her example. Thinking I had better get them all together as soon as possible I raised the netting and allowed the whole four to go out into the public stream, and there they caroused and cavorted all night and all next day with hardly a moment's stop so far as I could discover. They did not seem to get hungry, for they made the discovery that the yellow moss* floating on the stream was good for

*We also have chick feed and water penned off by two-inch netting, so the chicks can always get food and drink without being tramped on and bullied by the older fowls. Cosgrove, in the *Rural New-Yorker*, calls these places for chicks, when kept in yards for larger fowls, "cities of refuge." I am glad to be reminded that friend C. is keeping in touch with his Bible.

*This moss that floats on the water is a sort of vegetable growth or algae that often forms on spring water where it is exposed to the heat and light of the warm sun. The water of this brook or drainage canal is probably, a large part of it, from the various artesian wells along its course, and this accounts for the abundance of moss the ducks seem so fond of.

food; and with the fish and aquatic animals they caught where the fresh and salt water commingled they seemed to be well supplied with food without any expensive *grain* ration. Edgar Briggs, in his book, has a chapter on keeping poultry in a way that you will have "nothing to do but gather the eggs;" hadn't I gotten it to a dot? There was just one little trouble: *Wesley* gathered the eggs, which were found these times in the bottom of the brook; and as he had to crawl through a fence made of netting and barbed wire, and then walk over the sharp stones of some kind of coral rock in the bed of the creek, "gathering the eggs" was no small "joak" after all. I am glad to tell you that we have the ducks at this date (Feb. 9) so trained that they lay their two eggs every day in a nice nest on dry land and they also understand they can't "go in swimming" until said eggs are in my hands, and that is usually before daylight every morning. There have been no more aviation experiments up to date. They evidently think *aquatics* preferable.

Right here I want to whisper a word to my good friends the Wright brothers. A year or two ago they made some experiments on a craft partly in water, and partly in air. Well, my ducks are experts in that trick. A few days ago a Leghorn rooster was so unlucky as to get over the fence on the edge of the water. As soon as the four "duck-eyes" saw his predicament they remembered they hadn't had any fun chasing chickens for a long while, and they, one and all, shot over the water as if they had been fired out of a cannon. Their wings and legs both flew like buzz-saws, while the water flew in rainbow sprays, and the rooster (frightened out of his wits) rushed to me for protection. Where the soft fresh water pours into the bay when the tide is down, there is quite a pretty little waterfall; and when we have visitors (and there are quite a few bee-friends coming from the great North almost every day) I am sure to find them all delighted with a view of the ducks, especially if they happen to be sporting and splashing about in the waterfall. And, by the way, I want to say the ideal place for ducks is beside *running* water. Lakes and ponds may do; but a stagnant muddy pool in clay soil is nothing to be compared with a running stream over a bottom of white sand, such as we have here in Florida.

Just one more thing: Duck eggs that are laid in the water, especially if they lie there for some time, are not *just* the thing for incubators or sitting hens—at least that has been my experience. The moss and the animal food they found in the water satisfied them for only a time, and it was their final hankering for the grains of nice yellow corn that enabled me to get them to come home just about sundown so I could let down the netting and fasten them in. At present we are setting every egg, and I am looking forward anxiously to the day when we shall have a lot of *ducklings* as well as ducks sporting in this beautiful clear run-

ning water, flowing over a bed of white sand thickly sprinkled with little shells that make it look for all the world like a sparkling rivulet with a pebbly bottom. And, talk about the beauty of swans! to my eyes my four ducks with their plump bodies and glossy plumage are handsomer than any swans; and the two eggs every morning, like "distance," "lend enchantment to the view." Do you wonder that I feel moved to say aloud when I go out in the morning, after my daily bath just before daylight, "praise God, from whom all blessings flow"?

To-day, Feb. 18, both ducks are still laying an egg each every morning, without a miss. I put the first three or four eggs under a hen, but as they were all but one dropped in the water I had only one fertile egg. This was started in the incubator, then put under a hen, and finally finished in an incubator. At just about 21 days, by putting the egg to my ear I could hear a faint tapping inside; at 22 days I distinctly heard the duck peep in answer to my taps on the egg with my finger-nail. At 27 days the egg was chipped, and on the 28th day, after dark, my duckling was out of the shell. Next morning, when the sun was well up, he was scampering around outdoors in the Florida sunshine. Of course, he was out only at intervals, for, like his owner, he at present needs frequent periods of rest and sleep. All the duck eggs are being put under hens, so far, and my last two tests of ten and twelve eggs respectively showed *every* egg fertile. This is quite a contrast to the troubles we have been having with so many unfertile Buttercup eggs.

Lest some should rush to the conclusion that this may be a fault of the Buttercup males, let me add that hens from other yards were almost determined, so it seemed, to get in with this gaudily attired Buttercup rooster with his lordly and majestic bearing—so much so that, about this time, I counted up one day 25 hens, mostly White Leghorns, following in his wake. Lucky (isn't it?) that I am not in the business of selling eggs? Well, I have now cut down his "harem" to less than a dozen females, and am watching for a better report on "fertile eggs."

THAT "PRIMING WIRE," ETC., PAGE 119, FEB. 15.

After what I said about getting the Sears automobile started was in print I received the following from the makers:

The wire which you find extended through the frame of your car and attached to the butterfly valve in the air intake of your carburetor is there to enable you to shut off your air when cranking the motor. This action will permit of a rich charge being drawn in your cylinders, which will be easily ignited by the spark-plug. Very few of our carburetors have a priming-device and *also* this butterfly valve in the air intake; but it does no harm to have both. They really are for the same purpose—that is, to permit of easy starting of the motor.

Chicago, Jan. 30,

SEARS, ROEBUCK & Co.

You will notice this implies that this "starting wire" is to be pulled back and *held* back while cranking, whereas we, sup-

posing it to be to start the gasoline, let it spring back in place while cranking. I give place to this, for cranking automobiles has now become a fatiguing task to many people.

REDBUGS, JIGGERS, ETC.

I get away with redbugs with five to ten drops of carbolic acid in a tumbler of water—more or less acid as you wish. One needn't send a dollar for the secret. But such bugs are not peculiar to Florida at all. Except six years at school in New England I have lived my whole life in Kentucky and Tennessee. Though I traveled in nearly all the States, I have never yet found a place where they could not be found. I am in the real-estate business and mortgage loan agent for the Union Central Life Ins. Co., of Cincinnati, Ohio, and do much inspecting of farm and timber lands; and at the right season for them, when I go to inspect woodlands I always carry with me a small bottle of the above, and apply it at once the first night after being out, and have no more serious trouble from them; whereas without it they will make life miserable for two to four days after being in the woods. The country people are seldom bothered with them. The bugs seem to like fresh blood just from town. In Florida, no doubt, they are worse on account of greater dampness making more decaying wood, though I have no doubt that in Ohio, if you try at proper places you will find more than you wish to come in contact with. The timber being so much scarcer there, and the rotten parts kept cleaned up for use so much closer, I guess is the reason you don't find them at all common. Country folks here call them "chiggers." I don't know how the dictionary spells it. I consider it a joke on a city fellow to lead him unwittingly around through places infested with them, and get him well covered by them.

Paducah, Ky., Sept. 6.

W. M. JANES.

Friend J., I am glad to know that redbugs are not confined *particularly* to Florida ("misery loves company," you know), although I can not remember having been troubled by them anywhere else. Anything will stop the itching that makes the feverish eruptions smart; and we have rather settled down on sal soda moistened just a little. Rub it briskly where you have been bitten, and the itching sensation will give place to a smarting from the strength of the alkali. When the smarting is gone, the itching will be over for the present. I have not yet found an entomologist who could tell me whether these insects penetrate the skin. I know they are often called chiggers or jiggers, but this is certainly a mistake, for the real jiggers are what I have described as the stick-tight flea, sometimes found in great numbers on the combs and wattles of common fowls; and in Florida during a dry time they get on people. These produce no swelling; but when they crawl down under the skin and get to sucking blood they produce a very unpleasant sensation. These rarely or never trouble when there are steady rains. They are large enough to be plainly visible; and when they are pulled out of the flesh with a pair of watchmaker's tweezers the trouble is all ended, and no eruption nor itching follows.

DRUGS FOR BABIES.

It is a cruel thing to give poor innocent chickens drugs and poisonous medicines, especially if we neither know what the trouble is, nor what the medicine is; but it is a

thousand times more shameful and cruel to give to *babies* these dangerous and baneful drugs. Read the following, which we clip from the *Union Signal*:

BABY-KILLERS.

It is good to see that the leading daily papers are beginning to speak plainly about harmful medicines. Back of the general awakening is the attention chemists are giving to this matter, and the fact that the government itself is moving in the right direction. Perhaps, after awhile, we will take as good care of the health and lives of babies as stockraisers have long taken of calves and lambs.

Just now Dr. L. B. Kebler, of the Bureau of Chemistry, in the Agricultural Department at Washington, D. C., is saying, "Babies doped with soothing-syrups containing harmful drugs are particularly liable to infantile paralysis and kindred diseases." He has made public a list of thirteen soothing-syrups which he calls "baby-killers," and against which he warns the public.

Dr. Kebler has suggested that druggists enter into an agreement not to sell these harmful drugs except upon prescription from a physician. He also classes Jaynes' carminative balsam as a "killer."

Some of Dr. Kebler's "baby-killers" have been printed on these pages before, but they can not be held up to the public eye too frequently, so here they are:

Mrs. Winslow's soothing syrup (morphine sulphate).

Children's comfort (morphine sulphate).
Dr. Fahey's pepsin anodyne compound (morphine sulphate).

Dr. Fahrney's teething syrup (morphine and chloroform).

Dr. Fowler's strawberry and peppermint mixture (morphine).

Dr. Groves' anodyne for infants (morphine sulphate).

Hooper's anodyne, the infant's friend (morphine hydrochloride).

Jadway's elixir for infants (codeine).

Dr. James' soothing syrup cordial (heroin).

Koepp's baby's friend (morphine sulphate).

Dr. Miller's anodyne for babies (morphine sulphate and choral hydrate).

Dr. Moffett's teething powders (powdered opium).

Victor infant relief (chloroform and *cannabis indica*).

Now, if you have any of the above medicines in your home we hope you will destroy them at once before there is a *possibility* of their harming innocent children.

My subscription to GLEANINGS may be extended for another year. I feel sure that my boys and I shall find "Camping and Woodcraft" very entertaining as well as profitable. My continued subscription to GLEANINGS is for the great pleasure I find in "Our Homes" department, by grandfather Root. May he live yet many years to continue his good work.

Delamar, Idaho, Dec. 10.

H. J. STUART.

I want GLEANINGS as long as I live. It's all right, and I don't know how it could be improved. I am much interested in the "Home" articles and A. I. Root. May he long live to give us cheering and helpful articles.

The illustrations are perfect, and I am much pleased with the moving-picture department, and, in fact, with every thing from the index to the last advertisement.

Abilene, Kan., Dec. 15. DR. FRANK PARKER.

I received GLEANINGS, which, for the last thirteen years, has been a welcome visitor, and has never failed a single time that I can remember.

I certainly would have remembered if my friend had failed to come. It is more and more interesting every year if not every month. I have "The A B C of Bee Culture" and some other bee literature. I should like to have more; but if any one bee paper will answer the purpose of all other bee papers, I think that GLEANINGS will. It certainly is a good paper from cover to cover, and even the cover is interesting.

Miss SARAH A. AUSTIN.
Powers, Colo., Dec. 13.